

**The experience of critical thinking within upper secondary
education. From theory to practice.**

by

Akylina Samara

**Dr. polit.- dissertation 2002
Faculty of Social Sciences and Technology Management
Department of Psychology
Norwegian University of Science and Technology, NTNU
Trondheim**

TABLE OF CONTENTS

INTRODUCTION.....	1
CHAPTER 1: REVIEW OF THE LITERATURE	5
1.1. INTRODUCTION	5
1.2. CRITICAL THINKING: ITS NATURE AND INSTRUCTION.....	6
1.2.1. <i>The origins of critical thinking</i>	7
1.2.2. <i>The traditional view</i>	9
1.2.3. <i>Challenges to the traditional view</i>	16
1.2.4. <i>Critique of the literature</i>	24
1.3. LEARNING STRATEGIES	26
1.3.1 <i>General theoretical presentation</i>	26
1.3.2 <i>Learning strategies and critical thinking</i>	32
1.4. REFORM 1994	34
1.4.1. <i>Background</i>	35
1.4.2. <i>Objectives and goals</i>	36
1.4.3. <i>Theoretical analysis</i>	39
1.4.4. <i>Final remarks</i>	44
1.4.5. <i>Reform -94 and critical thinking</i>	46
1.5. STUDENT OMBUDSMAN	47
1.6.THE GOALS OF THE STUDY.....	48
CHAPTER 2: METHOD.....	50
2.1. RESEARCH APPROACH.....	50
2.1.1. <i>The individual's perspective</i>	51
2.1.2. <i>The choice of the qualitative approach</i>	55
2.1.3. <i>The meeting with phenomenology</i>	57
2.2. PHENOMENOLOGY.....	57
2.2.1. <i>Phenomenological philosophy</i>	58
2.2.2. <i>Phenomenological philosophical method</i>	61
2.2.3. <i>Phenomenology within psychology?</i>	64
2.2.4. <i>Amedeo Giorgi</i>	65
2.2.5. <i>The phenomenological psychological method by A. Giorgi</i>	69
2.2.6. <i>The scientific status of the method</i>	75
2.2.7. <i>Phenomenological research on thinking and learning</i>	84
2.2.8. <i>Critique of A. Giorgi's method</i>	86
2.2.9. <i>Why Giorgi's method?</i>	88
2.3. A CLOSE EXAMINATION OF THE METHOD AS APPLIED.....	89
2.4. PARTICIPANTS – DATA COLLECTION.....	94
2.4.1 <i>Pilot study</i>	95
2.4.2. <i>Main study</i>	96
CHAPTER 3: RESULTS.....	99
3.1. G. HERNES	99
3.2. THE PEDAGOGICAL LEADER	101
3.3. SCHOOL 1.....	102
3.3.1. <i>Principal</i>	102
3.3.2 <i>Teacher FO</i>	103
3.3.3. <i>Teacher – DD</i>	104
3.3.4. <i>Teacher – AA</i>	105
3.3.5. <i>Student – FO (Female)</i>	105
3.3.6. <i>Student – FO (Male)</i>	106
3.3.7. <i>Student – DD (Female)</i>	106
3.3.8. <i>Student – DD (Female)</i>	107
3.3.9. <i>Student – AA (Female)</i>	108
3.3.10. <i>Student – AA (Female)</i>	109
3.4. SCHOOL 2.....	110
3.4.1. <i>Principal</i>	110

3.4.2. <i>Teacher 1</i>	111
3.4.3. <i>Teacher 2</i>	112
3.4.4. <i>Teacher 3</i>	112
3.4.5. <i>Student 1 (Male)</i>	113
3.4.6. <i>Student 2 (Male)</i>	113
3.4.7. <i>Student 3 (Male)</i>	114
3.4.8. <i>Student 4 (Male)</i>	115
3.4.9. <i>Student 5 (Male)</i>	115
CHAPTER 4: DISCUSSION	116
4.1. ELABORATION OF THE RESULTS	116
4.1.1 <i>Critical thinking – the participants and their experiences</i>	117
4.1.1.1 School 1	117
4.1.1.2. School 2	189
4.1.1.3. Summary of the section.....	243
4.1.2 <i>Critical thinking –the two school cultures</i>	243
4.1.2.1. The principals of the two schools.....	244
4.1.2.2. School cultures	263
4.1.2.3. Summary of the section.....	268
4.1.3. <i>Critical thinking – its metamorphosis from theory to practice</i>	269
4.1.3.1. Gudmund Hernes and the school participants	269
4.1.3.2. The Pedagogical Leader and the rest of the participants	301
4.1.4. <i>Summary of the section</i>	315
4.2. DIALOGUE WITH THE LITERATURE	316
4.2.1. <i>Critical thinking literature and the participants' experiences</i>	316
4.2.2. <i>Learning strategies literature and the participants' experiences</i>	343
4.2.2.1. Learning strategies content and instruction	343
4.2.2.2. Learning strategies and critical thinking.....	348
4.2.3. <i>Student ombudsman and the participants' experiences</i>	350
4.2.4. <i>Summary of the section</i>	361
CHAPTER 5: CONCLUSION	365
5.1. SUMMARY OF THE STUDY	365
5.2. CONTRIBUTION OF THE STUDY.....	366
5.2.1. <i>Critical thinking and the research findings</i>	366
5.2.2. <i>Practical implications</i>	369
5.2.3. <i>Learning strategies and the research findings</i>	371
5.2.4. <i>Reform –94 and the research findings</i>	373
5.3. CRITIQUE OF THE STUDY	378
5.3.1. <i>The method applied in relation to the study goals</i>	378
5.3.2. <i>The researcher's presence</i>	381
5.4. SUGGESTIONS FOR FURTHER RESEARCH.....	383
5.5. FINAL REMARKS.....	384
REFERENCES	386
APPENDIX	398
APPENDIX A	1
RAW DATA AND ANALYSES	1
SCHOOL 1.....	1
PRINCIPAL.....	1
TEACHERS.....	22
FO	22
DD.....	28
AA.....	36
STUDENTS.....	41
FO (FEMALE).....	41
FO (MALE)	44
DD (FEMALE 1)	48
DD (FEMALE 2).....	52

AA (FEMALE).....	60
AA (MALE).....	72
SCHOOL 2.....	78
<i>PRINCIPAL</i>	78
<i>TEACHERS</i>	97
TEACHER 1.....	97
TEACHER 2.....	100
TEACHER 3.....	105
<i>STUDENTS</i>	110
MALE 1.....	110
MALE 2.....	113
MALE 3.....	115
MALE 4.....	117
MALE 5.....	120
PEDAGOGICAL LEADER.....	123
GUDMUND HERNES.....	132
STUDENT OMBUDSMAN.....	162
APPENDIX B.....	173
FIGURES, ENCLOSURES AND TABLES.....	173
FIGURES.....	174
<i>Fig. 1-2. Hernes</i>	174
<i>Fig. 3-7. Hernes</i>	175
VARIOUS ENCLOSURES.....	177
1. <i>Information given to the students and teachers – pilot study (translated)</i>	177
2. <i>Pre-planned interview questions - pilot study (translated)</i>	178
3. <i>Instructions for the written descriptions - pilot study (one question per student - translated)</i>	179
4. <i>Paragraphs from the Core Curriculum on critical thinking that all the participants read before the beginning of the interview</i>	180
5. <i>Participants – main study: teachers and students</i>	181
TABLES.....	183
<i>Results</i>	183

INTRODUCTION

Current times are characterised by technological achievements that develop at rapid speed. Vast volumes of information which demand efficient analysis and comprehension are transmitted on a daily basis. As Halpern (1998) put it:

"People now have an incredible wealth of information available [...] The problem has become knowing what to do with the deluge of data. The information has to be selected, interpreted, digested, evaluated, learned, and applied [...] If people cannot think intelligently about the myriad issues that confront them, then they are in danger of having all of the answers but still not knowing what the answers mean." (p. 3).

At the same time, our society is experiencing constant change. Prominent incidents take place world-wide; people are required to interpret and judge them by direct reference to the power relations and historical-political elements involved. Countries become multi-national so that one has to go beyond the limits of the strictly personal experience and view things from other perspectives; one has to comprehend and accept other cultures, races and traditions.

In other words, people are called to give meaning to their world, so as to preserve a sense of control. However, the process of defining oneself involves the hazard of getting lost in the plethora of stimuli present in loose frameworks. This strenuous process never ceases; as adults, people are often faced with the assignment to question previously established norms and beliefs, the present rules, the ready-made solutions offered to their problems (Brookfield, 1991).

People should thus possess those means that enable them to actualise the above tasks. Critical thinking is one of them, as it provides with a shield against acting without being aware of the consequences, against forming beliefs and adopting ideologies without having examined their morality and uncovered their hidden purposes.

Moreover, people feel more connected to the events around them when demonstrating critical thinking. Our society sets the focus on the individual's development, ignoring the relation of the self to the broader social context. Critical thinkers are able to view their private events from a social perspective, to make connections between separate elements and attribute causes to the situations met. This attitude is the cornerstone of a healthy, democratic society, where people's relations are characterised by mutual respect.

"When we think critically we become aware of the diversity of values, behaviors, social structures, and artistic forms in the world. Through realizing this diversity, our commitments to our own values, actions, and social structures are informed by a sense of humility; we gain an

awareness that others in the world have the same sense of certainty we do -but about ideas, values, and actions that are completely contrary to our own." (Brookfield, 1991, p. 5).

In other words, critical thinking contributes to the development of responsible adults, both in a private and a social sense.

School is regarded as one of the main institutes preparing children for a future life as responsible adults. Critical thinking should therefore comprise a primary goal of education, considering its importance within both the personal and social sphere. Even though this importance has been widely recognised and emphasised, especially during the last decades, education is still struggling to empower students with critical thinking. As an example of the extent of the situation, McGrane & Sternberg, (1992) comment:

"Hundreds of reports from numerous committees and research point to the fact that our nation's [USA] children still cannot think well and that our schools are not yet teaching students to think. Sadly, many of the calls for teaching thinking that were made over 100 years ago, rather than sounding archaic, are still pertinent today." (p. 333).

Part of the reasons why the schools do not employ critical thinking successfully, is the lack of a widely accepted conception of critical thinking. When a concept is about to be applied in the classroom, questions concerning its *nature* are first of all posed. Specifically, identification of the characteristics of critical thinking clarifies issues concerning its instruction (Bailin; Case; Coombs, & Daniels, 1999). For instance, specification of the skills involved and of whether they are generalisable, are factors which determine *what* will be taught; meaning a set of specific skills and actions or a general attitude. In addition, the above directs *how* the instruction of such skills and attitude will take place; meaning as separate or integrated part of the curriculum.

Moreover, the adopted conception of critical thinking directs certain methods of assessment. Those who uphold that critical thinking consists of a set of identifiable content-laden skills, for example, ask for standardised tests, or a pre-test post-test measurement. On the other hand, those that support the transferability of critical thinking in new contexts, use portfolios or working logs that give access to the working process and the organisation of information (Adams & Hamm, 1994). Moreover, when education in critical thinking is believed to bring changes in behaviour, observation of the students while working is suggested.

Besides, the school curriculum and the teacher's role are influenced by the way critical thinking is perceived. Emphasis on rationality and a specific 'logical' process that has to be followed under the evaluation of an argument, for example, is related to the establishment of a

curriculum characterised by a concrete body of knowledge that the students have to master. Such a curriculum is carefully planned and organised, and includes pre-determined learning goals. Accordingly, the teacher is trained to convey the curriculum; s/he is considered the 'legitimate' source of knowledge, an assertion which assigns high authority to his/her role. However, when examination of the extant societal norms and rules is considered as part of the education in critical thinking, together with elaboration on the construction of knowledge and the latter's relation to power, then the curriculum takes a rather different form. The emphasis is no longer put on the subject-matter, but on the development of the self, the analysis of societal problems and the building of a better society. The curriculum ceases to be the primary source of knowledge; the latter is created by the students, who co-operate closely with the teacher. S/he takes up the role of a guide, who has the same authority as the students (Klein, 1990).

The scholars engaged in those topics pertain mainly to the philosophical sphere, followed by psychologists and educators. Each group addresses critical thinking from a different perspective. Still, the issues examined are interconnected, and thus cannot be isolated when critical thinking application within schools is discussed. One should refer for example, to the *nature* of critical thinking (a subject occupying mostly philosophers), in order to decide *what* should be taught (usually a psychologist's concern) and *how* it should be taught (a core interest of educators).

The one-sided attention to a particular aspect of critical thinking that the theorists usually pay, disunites the phenomenon in an artificial way. This fragmentation is expressed in diverse theories and inconsistent research findings, which make the task of elucidating critical thinking even more complex.

Such a theoretical vagueness has unfortunate consequences for the application of critical thinking at school, as the main topics regarding its instruction are not totally clarified. Training into critical thinking depends mainly on the individual teacher, who first decides whether it is worth including in the instruction, and then chooses the concrete instructional method, according to his/her beliefs and conceptions. As the situation is ambiguous, the teacher is not always capable of determining what critical thinking entails, and hence does not always pay the proper attention to it, or does not promote it in an efficient way. This leaves the students with a sense of confusion concerning the meaning of critical thinking, the way it is applied, the skills involved, or the techniques that need to be learnt (Kuhn, 1999). Consequently, the beneficial effect critical thinking instruction could have on the students

developing better self-awareness and apprehending their social surroundings, is not experienced fully.

This situation of uncertainty obligates a shift in the manner the phenomenon is approached. Instead of relying on theoretical constructions about the proper way critical thinking should be promoted, we should examine directly the actual way critical thinking functions in the classroom reality. Information acquired at first hand about the influential factors and about the concrete problems faced under the instruction and employment of critical thinking is valuable to the clarification of the phenomenon. In other words, what is particularly needed is knowledge on how the school participants encounter the phenomenon under their everyday school activities. The teachers' and students' experiences of critical thinking should become the focus of research; the messages they convey compose valuable information for the designing of instructional critical thinking programmes.

The present study attempts to shed light on the phenomenon of critical thinking within schools by taking an immediate look at the actual arena it operates within. The main focus is those who participate actively in the educational realm and the particular way they deal with various aspects of critical thinking. Such an approach gives direct access to the phenomenon, and provides unique information for its further clarification.

CHAPTER 1: REVIEW OF THE LITERATURE

The first chapter comprises of three main parts. The first contains the research literature regarding critical thinking and a closely related topic, learning strategies. The most representative theories are given, in accordance with the scope of the present study.

The second part addresses the frame within which this study is conducted, namely the Norwegian educational sphere. Specifically, a presentation of the Reform -94 and the concrete role of the student ombudsman is made.

Finally, the specific goals of the present study are presented.

1.1. INTRODUCTION

The literature pertaining to the present study ranges from the late 80's up to 2001. The reason why the particular beginning date is chosen lies in the fact that the issues implicated became a focus of research the last years only. Besides, the literature regarding Reform -94 is mainly obtained from the years surrounding the actualisation of the Reform at the Norwegian schools.

Specifically, the following data-bases are used for the literature research:

- BIBSYS, ISI, ERIC, PsychINFO, Ph.D. dissertations/master dissertations UMI & in Norway, Forskpro, Forskpub, Norart, Ntnu-ansatte, EBSCO online
- CATHCWORD; the following journals were investigated:
 - International Journal of Qualitative Studies in Education
 - British Journal of Sociology of Education
 - Comparative Education
 - Educational Review
 - Educational Studies
 - European Journal of Education
 - Journal of Curriculum Studies
 - Oxford Review of Education
 - History of Education
 - International Journal of Lifelong Education
- Infoconnect

- www.elibrary.com

- Phenomenology Online

→ keywords searched: critical thinking and -skills, -assessment, -tests, -teaching, -upper secondary education; learning strategies and -assessment, -inventories, -instruction, -research; learning disabilities and -learning strategies, -critical thinking, -motivation; Reform -94 and -evaluation; Norway and -reforms, -school evaluation, -upper secondary education, -curriculum; educational psychology, phenomenology, human science, meta-analysis and qualitative research, meta-analysis and quantitative research, qualitative methods and -theory, -research, -schools, -learning, classroom interaction; qualitative interviews, subjectivity, intersubjectivity, reliability, validity, students' perceptions, teachers' perceptions, teachers' education

- Aftenposten, Adresseavisa, VG; keywords searched: Reform -94

Finally, let me note that the above list contains the literature pertaining also to the 'Method' chapter.

1.2. CRITICAL THINKING: ITS NATURE AND INSTRUCTION

Critical thinking is a prevalent topic of discussion within the educational realm nowadays. The reason for the particular attention the concept receives lies in the widely recognised role it has in the school reality. At the same time, an urgent need to clarify various issues involved in critical thinking emerges, as the concept's painstaking character leaves space for various kinds of understanding and interpretation.

Specifically, in an attempt to organise the topics covered by the critical thinking literature, I have come up with two general categories pertaining to critical thinking: its *nature*, and *instruction*. Those include other sub-themes, which are presented later.

The present section is an attempt to draw the extant picture of critical thinking from an educational perspective. That means that the presupposition underlying the presentation which follows is that critical thinking plays an essential role in schooling, and is an object of learning; research should aim at the discovery of the most effective instructional method for its development and promotion.

Since the various general topics concerning critical thinking are interrelated, as mentioned earlier, the presentation is organised around central theorists of critical thinking,

instead of around fragmented concepts. Specifically, it is laid out in a historical manner, starting from the traditional approaches to critical thinking, and moving to the more contemporary conceptualisations.

Specifically, the nature of critical thinking entails further sub-themes: *definition, components, skills and disposition, generalisability, functions of, metacognition, emotions, arts*. The instruction of critical thinking includes among others, the *teacher's role, milieu, the subject's nature, curriculum, learning strategies, obstacles in changing the educational practice*¹.

1.2.1. The origins of critical thinking

A presentation of critical thinking would be incomplete without reference to its roots. The word 'critical' stems from the Greek verb *krinein* which means 'to judge the value of'.

The first shreds of a critical thinking theory can be traced back to the Ancient Greek philosophers Plato and Aristotle.

Briefly, Plato (Katsimanis & Roussos, 1986; Thayer-Bacon, 2000) supports that the world is divided in two; into the ideas (*idees*) and their shadows (*skies*). The epistemological notion underlying his theory is that the objects are representations of their ideas; in other words, all qualities have a central essence. Those essences carry the feature of universality and stability, they exist independently of time and space.

Accordingly, Plato defines what an argument is, based on those universal essences. He suggests that the soul (*psyche*) is immortal, has seen all the things and thus knows true from false, right from wrong. Subsequently, knowing means discovering what the soul already knows, finding those universal essences, the absolute.

Plato claims there is an objective Correct and Good, existing as an idea. Hence, the goal of knowledge is the re-discovery of the Truth². The process of arriving at such a recognition comprises of a continuous mental dialogue between theory and praxis, meaning between the ideas and the real experiences. This is what education consists in, constant reflection on the above exchange.

This process requires certain abilities and corresponding training. Those who arrive at the final knowledge -the recognition of the idea- can apply it in the everyday world. Hence, the instruction of the above requires the presence of 'specialists', who hold the power of knowing. Those are the philosophers, who belong to the upper class of the educational

¹ the lists are representative and not exhaustive.

² the etymology of the word 'philosophy' conveys also the same, since it means 'the love for the truth'.

system.

Finally, Plato supports that the soul belongs to the world of ideas, whereas the body to the world of sensations. Thinking is considered superior to labour, as the first involves qualitatively superior abilities and skills. The senses are not adequate to recognise the truth.

Aristotle criticised Plato and his theory on the 'ideas' by claiming that ideas do not exist independently of the objects, but rather exist *within* them. He supports that all beings comprise of two elements; substance (*ili*) and form (*morphi*). In other words, there exist basic essences which appear in a certain form, thus in different ways, in accordance with determined principles.

This initial basic (*a-genniti*, a-genesis, non generated) essence can be recognised through thought (*skepsis*). However, both thought and experience are necessary for this process. We recognise first with our senses, and then with the use of abstraction arrive at the general and essential. Hence, the senses play quite a big role in Aristotle's theory.

Science is the recognition of those essential characteristics of the things, the discovery of the Truth. Recognition requires the application of *sylogisms*, meaning logically sound sentences which play an assisting role in thinking, especially under the drawing of conclusions. Aristotle provides a systematic method of revealing fallacies, of discovering the 'truth', which starts from the result and goes backwards to discover the cause; this is the way to justify the conclusions. He trusts the inquirer's intuition for what causes are certain or not; this intuition develops through experience.

The above is executed with the help of Logic. Logic underlies all disciplines, without being a discipline itself. Aristotle supports that the humans' function is to reason, and this is why they differ from the animals. The best method to learn how to reason is provided by liberal arts education. In the case of ancient Greece, this method was actually available only to few; only citizens could participate in it³.

Commenting on the above, Plato's theory of the 'ideas' contains elements that constitute the basis of the contemporary notion of objectivism; the object of knowledge and the person who has the knowledge are separated. Moreover, the possession of knowledge seems to be a matter for an elite, who demonstrate special abilities; they are in charge of communicating the way to arrive at knowledge further, which is open to all. The individual and his/her intellectual mechanisms is in focus.

Another notion pertaining to Plato that can be located within the Euro-western thought is dualism. The beginning of the body/mind split is located in Plato, who advocates

that the bodies are an obstacle to our knowing. Gymnastics and music according to him correspond to the lower levels of intelligence, whereas mathematics, science, and philosophy to the higher. Thus, the mind is higher than the body; the two are separated.

Aristotle on the other hand, supports that our ideas should be tested in the world, via our experiences; when the ideas match with the material things, then we have arrived at the truth. This notion can be considered a parallelism to the contemporary hypothesis testing. Aristotle's logical reasoning is our critical thinking.

Moreover, Logic and self-reflection are central in Aristotle's theory. The knowers do not construct knowledge socially, but rather discover the answers individually. Finally, Aristotle provides an elitist epistemological theory, as not all can participate in the discovery of the truth.

After having presented the origins of critical thinking, the two main current approaches are now examined.

1.2.2. The traditional view

In general, the traditional view of critical thinking puts emphasis on *reasoning*. Reasoning encompasses an objective process that leads to the discovery of the right answers once following its rules correctly. As Thayer-Bacon describes it (2000):

"Traditional Euro-western critical thinking theories draw our attention to critical thinking's products [...] These theories tend to present critical thinking as an unbiased, neutral, objective, universal activity which relies mainly on the superior tool of reason. With the use of reason, critical thinking will answer our questions, solve our problems, and disclose Truth, for critical thinking supplies us with a universal set of criteria for judging ideas." (p. 160).

The main representatives of this approach are presented separately.

Robert Ennis

Ennis suggests that critical thinking consists of both skills -which are its *cognitive aspect*- and dispositions -which refer to its *affective aspect* (Kennedy; Fisher & Ennis, 1991). The main function of critical thinking is to enable the evaluation of own and others' arguments and the resolution of discords, to enhance comprehension, and to lead to the discovery of a solution to perplexing problems (Allegretti & Frederick, 1995).

The definition of critical thinking that Ennis adopts is an alteration of his original 1962 definition; the latter had been criticised as confusing process with output and neglecting the

³ i.e. not women or slaves.

tendency necessary to engage in the process. His new definition champions that critical thinking is:

"[...] reasonable reflective thinking that is focused on deciding what to believe or do [...]" (Ennis, 1992, p. 22).

Specifically, Ennis provides a list of twelve abilities and fourteen dispositions necessary to the employment of critical thinking. Some examples of those are; a) *dispositions*: reason seeking, search for alternatives, open-mindedness, sensitivity to the feelings and to the level of knowledge of the others, b) *abilities*: identification of relevant criteria, of conclusions and of reasons provided (Kennedy et al., 1991). Ennis attempts, in other words, to give a set of criteria by which a critical thinker can be identified.

Concerning the instructional side of critical thinking, Ennis's asserts that by receiving training in logic, one subsequently develops critical thinking. He is a proponent of the mixed approach, which promotes independent teaching of dispositions and abilities, with a clear presentation of the general principles of critical thinking. Content is necessary, also in the sense of subject-matter (Ennis, 1992).

Ennis is also concerned with the issue of specificity in the instruction of critical thinking; he opposes those who argue for 'subject specificity' by saying that the concept is too vague. Instead, he proposes that distinct examination of the empirical, epistemological, and conceptual aspects of specificity should be made. He leans more toward the empirical and epistemological aspects of it, as they highlight the importance of background knowledge necessary⁴ to the application of critical thinking. He is rather an advocate the generalisability position, in the sense that once learnt at school, critical thinking can be also used under the problems faced in everyday life (Norris, 1990).

The evaluation of critical thinking is made by tests; Ennis is the co-designer of the Cornell Critical Thinking Test (Ennis & Millman, 1982; see Thayer-Bacon, 2000).

Ennis and his critical thinking theory have been a target of critique. His definition is labelled 'programmatic' (Norris, 1990). He has also been accused of being operationalistic due to his proposed list of criteria that pertain to the identification of critical thinking. Moreover, his list of abilities and dispositions are extremely detailed, and the tendency one has to utilise them is not being adequately analysed (Siegel, 1988).

Matthew Lipman

⁴ -but not sufficient

Lipman is one of Ennis's critics. He argues that Ennis's definition underlines the output rather than the features of critical thinking. Lipman, on the contrary, focuses on the actual critical thinking process. He purports that it engages criteria, comparison and standards. In that sense, critical thinking is similar to reasoning.

Specifically, critical thinking is:

"[...] skillful, responsible thinking that facilitates good judgment because it (1) relies upon criteria, (2) is self-correcting and (3) is sensitive to context [...]" (1988; see Johnson., 1992, p. 40).

Regarding instruction, Lipman is concerned with the degree to which the curriculum promotes the ability of thinking in a philosophical way. His focus is on teaching philosophy to children, as he believes that philosophy is the discipline which can provide the criteria for good reasoning. At the same time, he views the self as relational and social -the thinker is in dialogue with other thinkers (Thayer-Bacon, 2000).

The main critique on Lipman addresses his view that critical thinking and rationality are considered equivalent; this is fallacious, for rationality is a broader logical category (Thayer-Bacon, 2000).

John McPeck

McPeck embraces the domain-specificity of critical thinking, meaning that thinking is always directed to a specific thing. He claims that critical thinking consists of two components; the *ability* to evaluate reasons in a proper way, and the *disposition* to carry out this evaluation. The process is guided mainly by information and not logic, as the latter-according to McPeck- cannot provide arguments, hypotheses and solutions (Siegel, 1990; Thayer-Bacon, 2000).

McPeck purports that application of critical thinking requires a certain disposition and knowledge of the field. Specifically, he argues for both specific knowledge and a critical component; the latter involves the ability to reflect, question and judge. It is dependent on the amount of knowledge required by the problem (McPeck, 1990a).

According to McPeck, critical thinking pertains to rational thinking, which signifies the appropriate use of all the obtainable evidence in order to discover the solution to a problem (Thayer-Bacon, 2000). Critical thinking is:

"[...] the skill and propensity to engage in an activity with reflective skepticism [...]" (1981; see Johnson, 1992, p. 40).

The instruction of critical thinking should take place in close connection to subject-specific knowledge of the field, as critical thinking is not generalisable. This is clearly conveyed in the following:

"[...] an effective thinker in one area is not necessarily an effective thinker in all other areas [...] the knowledge and skills required for the one activity are quite different from the knowledge and skills required for the other." (McPeck, 1990a, p. 20).

Accordingly, and given the time restrictions schooling has, the students have the opportunity to be exposed only to limited amounts of knowledge. The curriculum should thus include this type of knowledge that has the most universal value. The curriculum which best satisfies this condition, is –according to McPeck- the liberal education (McPeck, 1990a).

The teacher is responsible for instructing the disciplines in an appropriate way, meaning for examining their structure. Discussion is considered the most effective teaching method. Moreover, effective instruction requires that the teacher him/herself is aware of the nature of the disciplines; s/he must possess analytical thinking.(McPeck, 1990b).

The instruction of critical thinking is bound to certain restrictions; such determinants are; the nature of some subjects, the educational requirements, and the teacher's willingness to set his/her authority open to examination. For example, McPeck (1990b) argues that:

"[...] some subjects, such as mathematics, are not quite too readily amenable to autonomous or critical thinking. In some subjects, that is, we are simply (and appropriately) trying to *train* students 'how to do it'. Thus, there is little room for critical thinking in some cases. This is not to say that these subjects do not allow critical thought, but simply that it is not the appropriate focus." (p. 51; emphasis in original).

McPeck's positions have been criticised rather extensively. The focus is on his not recognising the generalisability of critical thinking. The argument that specific knowledge is sufficient for the evaluation of judgements is considered false, as general worldviews for example, can also play a role. Besides, the school-subjects cannot always be separated as distinctly as McPeck supports, a view that has been characterised as atomistic (Paul, 1990). Moreover, it is supported that McPeck's presentation of general thinking confuses it with specific acts of thinking. Finally, the term 'reflective skepticism' McPeck uses as the core meaning of critical thinking, is quite vague (Siegel, 1990).

Richard Paul

Paul adopts more than one definitions of critical thinking, in order to capture its various aspects; he purports that one unique definition would set limits to such a complex concept. Thus, a condensed definition is:

"Critical thinking is disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking. It comes in two forms. If the thinking is disciplined to serve the interests of a particular individual or group, to the exclusion of their relevant persons and groups, we call it sophistic or weak sense critical thinking. If the thinking is disciplined to take into account the interests of diverse persons or groups, we call it fairminded or strong sense critical thinking." (see Thayer-Bacon, 2000, p. 61).

The essential in the above is that Paul embraces the existence of two types of critical thinking; the *weak* and the *strong* one. The first concerns thinking applied for one's own benefit, to promote one's own views; the skills required here are extrinsic to the person's character. The latter refers to application of thinking be consideration of the others, and which leads to personal insight; the skills required here are intrinsic to one's character. With this presentation, the role of disposition becomes central in the employment of critical thinking.

Another pivotal notion is that people are initially irrational and have to put effort to think critically (Thayer-Bacon, 2000).

Paul is an adherent of the generalisable nature of critical thinking. He justifies this assertion by referring to the conceptual schemes and their organisation in everyday life. Those schemes are rather flexible and able of performing various combinations. Thus, demonstration of critical thinking in one area can be transferred to other areas as well.

Regarding instruction, Paul suggests that the students should be made aware of the co-existing perspectives and multiple views that pertain to almost every aspect of life (Paul, 1990). He is particularly engrossed in the demonstration of critical thinking within everyday situations, as he believes people constantly consider and re-consider views and make judgements.

"The most important place that knowledge has in any lives is, on my view, that of shaping our concept of things *überhaupt*, our system of values, meanings, and interpretive schemes. This is the domain in which critical thought is most important to us. We spend only a small percentage of our livesmaking judgments as specialists, and even then we typically give a broader meaning to those acts as persons and citizens." (Paul, 1990, p. 109; emphasis in original).

Paul criticises the extant educational system by arguing that students do not learn how to question their own belief systems, but rather how to justify better what they stand for.

The new element that Paul's theory brings is the recognition of the role the others' play in the application of critical thinking. He underlines the need to see and understand the things from the others' perspective, to empathise with the others' views and judgements (Thayer-Bacon, 2000). However, his use of terms and concepts seems to be confusing, as the latter lack the required exactness (Thayer-Bacon, 2000).

Harvey Siegel

Siegel defines critical thinking as:

"[...] the focus on reasons and the power of reasons to warrant or justify beliefs, claims and actions. A critical thinker, then, is one who is appropriately moved by reasons: she has a propensity or disposition to believe and act in accordance with reasons; and she has the ability properly to assess the force of reasons in the many contexts in which reasons play a role [...]" (see Thayer-Bacon, 2000, p. 65; emphasis in original).

Siegel urges the engagement of principles in critical thinking; principles are requisite for the justification of good reasons. The person is free to choose them, but they are though subject to rational justification.

According to Siegel, critical thinking is characterised by two dimensions; the *reason assessment* component and the *critical spirit* component. The first comprises in the ability to evaluate reasons; it requires good comprehension of both subject-specific principles and logical principles of a general character. The latter refers to the attitudes, dispositions, habits of mind and traits that the critical thinker possesses, e.g. self-confidence, emotional security. Siegel purports for instance, that good psychological health and a positive view of oneself are conditions for applying critical thinking (Thayer-Bacon, 2000).

Siegel champions generalisability. He examines the issue by breaking it down into whether a) the reason assessment component and b) the critical spirit component are generalisable.

He (1992) advocates that firstly, the skills and criteria pertaining to reason assessment are general, as the epistemology underlying critical thinking is generalisable. This epistemology supports a:

"[...] radically non epistemic conception of truth [...]" (p. 104).

In other words, critical thinking aims at rational justification, and not truth. Hence, the reasons and rationale behind the supported beliefs are determined by the criteria employed in reason assessment.

Secondly, the critical spirit component is generalisable, for it includes dispositions, attitudes, habits, traits, which are generalisable.

Critics of Siegel refer to his use of the phrase 'appropriately moved by reasons', which includes terms not easily defined and specified. They also oppose his assertion that critical thinking is equal to rationality and in the same line as absolutism (Thayer-Bacon, 2000).

Diane F. Halpern

Whereas all the previously presented scholars are philosophers, Diane Halpern is a cognitive psychologist. Her theory on critical thinking pertains to the principles governing this domain of psychology.

Halpern's departing point is that everyday thinking is characterised by certain flaws, as for example people's belief in astrological predictions. According to her, 'correct' thinking means providing sufficient and valid data in order to support one's judgements.

Specifically, Halpern presents critical thinking as the use of cognitive skills and strategies that enable the achievement of personal goal, defined in accordance with the needs and wishes of the individual. Those skills are context-dependent; they include verbal reasoning, argument analysis, hypothesis testing, likelihood, decision-making and problem solving (Halpern, 1998).

"[...] critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed -the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking test." (Halpern, 1996, p. 5; emphasis in original).

Moreover, she argues for the need of certain dispositions under the employment of critical thinking; meaning a willingness to apply it, planned action, flexibility, a willingness to abandon non-working strategies, an acknowledgement of the social behaviour/norms involved (Halpern, 1998). Metacognition is also present, as a critical attitude encompasses one's awareness (Halpern, 1996).

The instruction of critical thinking is effective when it is content-laden and especially designed to promote transfer to other content domains, as well as to everyday life (Halpern & Nummedal, 1995). Training into critical thinking addresses the development of certain skills.

"Critical-thinking instruction is predicated on two assumptions: (a) that there are clearly identifiable and definable thinking skills that students can be taught to recognize and apply appropriately and (b) if these thinking skills are recognized and applied, that students will be more effective thinkers." (Halpern, 1998, p. 5).

Specifically, Halpern proposes the instruction of particular techniques which aim, among others, to the enhancement of information organisation in memory. The reason underlying this choice is that the use of cues enables the transfer of critical thinking to novel situations (Halpern, 1998). Moreover, the students' metacognitive skills should be promoted, for they are central to critical thinking.

"When engaging in critical thinking, students need to monitor their

thinking process, checking whether progress is being made toward an appropriate goal, ensuring accuracy, and making decisions about the use of time and mental effort. Metacognitive monitoring skills need to be made explicit and public so that they can be examined and feedback can be given about how well they are functioning." (Halpern, 1998, p. 8).

Finally, both instructors and learners should realise that critical thinking requires mental effort. This awareness can help avoid frustration and discouragement; the latter are commonly met when faced with the long process of thinking, where achievements take time (Halpern, 1998).

Criticising Halpern's theory of critical thinking, one can refer to the use of the expression 'desirable outcome' that it aims at. This expression carries the potential hazard of employing critical thinking for justifying own beliefs and actions. Moreover, the theory she presents is rather operationalistic, as she argues for the utility of memory cues, for example, that trigger the process of critical thinking. Besides, she seems to favour the identification of the use of critical thinking skills, as a means to assess its transferability to other content domains (see Halpern, 1998).

So far, the traditional approaches to critical thinking have been presented. As mentioned earlier, those theories -in general- discuss critical thinking by underlining the use of valid criteria and standards according to which a rational process takes place. Critical thinking leads to a specific goal which involves evaluation and judgement. Specific skills participating in the process are identified, as well as a certain attitude and disposition to make use of those skills. Regarding instruction, there is a certain debate on whether critical thinking skills should be taught within a subject-matter content or not, which depends on what it is embraced for the transferability of those skills.

1.2.3. Challenges to the traditional view

The more or less strict emphasis on cognitive processes and abilities is challenged by theorists who are in their majority adherents to the post-modern, constructivist and feminist approaches. Their conceptualisation of critical thinking differs in that they recognise the role of other elements in the process, such as the context, the others, emotions and so on. Kuhn (1999) expresses these differences as follows:

"On one side of the debate, traditionalists see it [critical thinking] as a set of mental competencies that reside inside individual heads. On the other, advocates of a newer, situated-cognition perspective regard intellectual skills as social practices exercised and shared within a community." (p. 24).

Barbara J. Thayer-Bacon and her theory is examined in some detail, as she is the main representative of this approach. Moreover, other theorists discussing particular topics are also elaborated.

Barbara J. Thayer-Bacon

Thayer-Bacon is a philosopher of education; she provides a re-conceptualisation of critical thinking, which builds on a feminist constructivist philosophy.

Her criticism (Thayer-Bacon, 1995) of the traditional epistemologies includes –among others- two main points. Firstly, the traditional approaches assert that knowledge exists autonomously, meaning that the issue of whose knowledge it is, is not a matter of investigation. Accordingly, the examination of the criteria of validity, justification, and verification, does not include the examination of how knowledge was acquired. According to this approach, knowledge is objective;

"[...] in the sense that discussion of the character and epistemic circumstances of subjects has nothing to contribute to the proper epistemological task of assessing the product." (p. 3).

Secondly, the traditional views separate ontology from epistemology, the knower from the knowledge. Thayer-Bacon, however, embraces the position that our world-beliefs are mutually influencing how we see the world and behave in it. The object of knowledge cannot be separated from the person who holds the knowledge, meaning from his/her individual characteristics, presuppositions, ideology (Thayer-Bacon, 1995).

Opposing the traditional view, Thayer-Bacon, proposes an epistemological theory called 'relational epistemology'. Briefly, its main characteristic is that it acknowledges the *construction* of theories and knowledge. Two assumptions are made; a) people are social beings who are 'embedded and embodied' and b) knowledge is a human contribution, is not found 'out there'. Knowledge construction takes place while people experience things and share the bestowed meaning with others. Accordingly, knowers are connected to knowledge (Thayer-Bacon, 1995); it is not possible to separate the self from the object, the knower from the known.

In her recent book "Transforming Critical Thinking: Thinking Constructively" (2000), Thayer-Bacon presents her relational epistemology and examines critical thinking from within that frame. She champions that critical thinking is a *tool*, constructed by humans; as such, it is exposed to mistakes, it is bound to be re-discussed and re-formed (Thayer-Bacon, 1995). Critical thinking is thus not objective, but rather -as any other tool- embedded into our culture

and lives; people determine its use and power.

"Critical thinking was and is viewed as the most objective, neutral tool that is available for all people's uses. It should become clear in the redescribing of critical thinking that, in fact, critical thinking is not neutral and objective. This belief that it is *unbiased* is based on an assumption that knowers can be separated from what is known [...]. Critical thinking is a tool that has no life on its own; it only has meaning and purpose when people use it, and as soon as people are involved in the use of this important tool, bias and error are involved." (2000; p. 3; emphasis in original).

In other words, the principal disagreement Thayer-Bacon has with the traditional approaches to critical thinking, is that the latter view the critical thinker as an isolated thinker who makes use of rationality in order to discover the correct answer/solution to the problem. Thayer-Bacon uses the image of Rodin's 'Thinker' in order to illustrate that; a thinker is a static male, who, isolated from the world, employs reasoning. Mental activity is central in this process, where other aspects of the people, like emotions are only recognised as a motivation to initiate thinking, and are otherwise considered destructive.

In order to explain the domination of the above picture, Thayer-Bacon examines the origins of the Euro-western paradigms within which critical thinking emerged. This examination begins at ancient Greece, with Plato's and Aristotle's conceptions of thinking.

As seen earlier, Plato's and Aristotle's theories indicate that the knowers do not construct knowledge socially, but rather discover the answers individually. The separation of body from the mind, the pursue of the objective, absolute Truth, and the elements of elitism in those theories are points that Thayer-Bacon opposes.

"Aristotle's epistemological theory [...] can rightly be classified as a theory that is sexist, elitist, and classist; it excludes women, manual laborers, artisans, slaves, foreigners, and conquered or dependent people. Not only is his image of the thinker male, he is a Greek man of property!" (2000; p. 23).

Thayer-Bacon attacks the above picture of the isolated thinker, and upholds that critical thinking should be examined within the context people form their experiences.

"The effort to separate people's experiences from their ideas is based on a false assumption that people and what they do can be separated from concepts and what they mean [...] I view knowing as an activity, a relational function, like dancing, singing, or loving, that is done with others. Our experiences shape our concepts and our concepts turn around and shape our experiences [...]" (2000; p.33).

In other words, knowledge is constructed within the social context we belong to. Concomitantly, ethical and political issues are involved in the product - knowledge. Moreover, physical, affective and cognitive abilities are developed while interacting with

others.

The epistemology Thayer-Bacon proposes is an extension of the definition/concept of epistemology; it conveys the desire to include aspects of knowing that have been left out and have been viewed as distracting, such as feelings, emotions, intuitions.

"[...] critical thinking -as described by current or past philosophers- is a limited, biased description. It is limited in that vital tools that help us be critical thinkers are ignored or diminished, such as our tools of imagination, intuition, and emotional feelings, while our reasoning tool is highlighted and underscored. The valuing of reasoning over all other abilities is also a gender bias and a cultural bias, inasmuch as reasoning -the ability to think abstractly and logically- has been identified in the Euro-western world as a male ability, whereas intuition, imagination, and emotional feelings have been associated with women's abilities [...] I call this redescribed critical thinking *constructive thinking*." (2000; p. 5; emphasis in original).

The above refers to the tools we employ while constructing knowledge; those include intuition, imagination, emotions, and reason. Thayer-Bacon (2000) analyses each tool in relation to critical thinking; a brief description follows.

a) *Reason*: It enables us to put our ideas in order. It contributes to the clarification of ideas and their organisation, to the creation of a structure. Reason encompasses also creativity; the latter is a special mode of thought which helps us break with the conventional. For instance, the criteria used to judge a novelty with, are not objective, but rather influenced by the tradition the novelty pertains to. Thus, reason alone cannot give us creative things.

b) *Intuition*: It facilitates the synthesis of our ideas in various ways, and the bestowing of meaning and understanding on the relations emerging. It also participates in the evaluation of our ideas. Feeling is involved in intuition; intuitively we might sense we are right. Intuition is a source of insight.

c) *Imagination*: It is related to our experience and ideas. It helps us understand plausible alternatives and contributes to the creation of new connections. It involves also empathy.

d) *Emotions*: Emotions motivate for action in the direction of critical thinking. Doubt and concern for example, initiate a selective process, which decides the particular area of interest which our examination will be directed at. It should be noted here that by emotions, intentional feelings are meant; meaning influenced by the context. Emotions are developed in a historical context, and are culturally defined.

Reason and emotions are knitted together, as the first's assessments represent a basis for the latter.

"If we are able to recognize that reasoning is an important tool in artistic expression, then we should be able to also recognize that emotions, intuition, and imagination are valuable tools to help us

constructively think." (2000; p. 137).

Thinking is expanded by the inclusion of emotions. Care is central in critical thinking, for without it we are not sensitive to the other's point of view. People need to reason from the other's perspective, they cannot perform evaluation in isolation. By taking the other into account, the people are enabled to identify individual and shared qualities. In other words, emotions help us in this process of understanding the other. At the same time, by comparing our experiences, we become more self-aware.

Certain skills required for this kind of thinking need to be developed; those skills are relational and communicational. They include listening to our emotions and letting our imagination free, in addition to reasoning skills.

In addition to skills, critical thinking involves the use of criteria. This point asks for particular attention. Thayer-Bacon suggests that critical thinking is biased, in the sense that universal criteria for validation do not exist. Reason is not objective.

"Reason helps us order and straighten and hold in place. Although reason does help us make judgment calls, it is not infallible or objective. Reason is only a tool which comes to life in people's hands, and people are fallible, embedded, and embodied social beings. Thus, reason is dependent on human use and can be used in many ways, both helpful and harmful, creative and destructive." (2000; p. 150).

Likewise, she upholds that the criteria for reasoning used within the traditional framework, serve the power forces that shape knowledge. They serve the benefits of the established authority. This domination forbids the consideration of other groups in the society, like women and minorities, as they usually do not pertain to the authority groups. Thayer-Bacon argues thus for the use of relative criteria, which are context-bound and allow the promotion of those neglected groups.

Accordingly, Thayer-Bacon embraces an instruction of critical thinking that primarily examines the power relations underlying the current societal status quo. The students should be encouraged to develop a personal insight via communication with others; they should train in seeing things from the others' perspective by acknowledging their feelings and following their intuition. Thayer-Bacon also emphasises that this process should take place in a physically and emotionally safe milieu, where one can express oneself and can feel secure to take risks.

Moreover, the students are considered as an interconnected 'bodymind', meaning integrating mental activity, feelings and physical sensations. The school material they work with should thus address all the senses. Art, imagination, feelings, and intuition are involved

in the process of choosing what to present and how; reason operates under the planning of this execution.

"Constructive thinking recognizes the epistemic role of the body, that we know what we can see and feel and hear [...] they [students] are learning through their bodyminds, translating what is concrete into abstractions." (2000, pp. 136-7).

Thayer-Bacon's theory is criticised for selecting only a narrow part out of the 'traditional epistemology' realm to refer to. Besides, by asking for relative criteria, her theory is valid only within the feminist framework. Thayer-Bacon has also been accused of being woman-centric, as the usefulness of knowledge is mainly decided on the good of the women (de Ruyter, 1995).

Other challenging theories

The other critical thinking theories pertaining to the same area as Thayer-Bacon, discuss at length some of the aspects already touched above. A selection of those issues is now presented.

Thinking is context- and culture bound: A rather big part of the 'challenging' theories is devoted to the role of the context in the employment of critical thinking.

Bailin et al. (1999) emphasise that critical thinking is never independent of the context it takes place in, meaning of the extant beliefs, values and accepted modes of acting that underlie the context. It is those that determine what a reasonable use of thinking principles means. Accordingly, knowledge of and experience with the particular context critical thinking pertains to, is necessary.

"Standards and principles of critical thinking are cultural artefacts that may be, and sometimes are, criticized and altered on the basis of our collective experience in using them [...] they are part of *evolving* traditions of inquiry and criticism." (p. 292; emphasis in original).

Likewise, Sarris (2000) supports that critical thinking is culturally and historically defined; it aims among other to the understanding of the self as a product of historical and social events.

Sarris also disputes the extant belief that it is certain people who can think critically and teach critical thinking to the others. This notion reproduces the kind of thinking that complies with the norms and rules of the historically and socially defined knowledge. These norms convey the idea that those who think differently, do not think critically. Critical thinking in that sense contributes to normalisation.

"What is taught is more likely to be a set of cultural norms associated with modes of a specific and culturally based type of critical thought [...] Intentionally or not, critical thinking is taught as a normalizing device. All that could engender strong-sense critical thinking –that which would challenge given assumptions and enable students and teachers 'to see beyond the world view that distort their perception and impede their ability to reason clearly' [R. Paul] – has been effectively excluded." (p. 61).

Agreeably, Kraft (2000) supports that the students should be challenged to question their own beliefs and assumptions, and eventually alter their world- and self-view. Corresponding questions should address the social reality, -fairness, -benefits, as well as examine alternatives to the extant establishments. The importance of the context is acknowledged in the understanding of the creation of power and knowledge.

"Critical thinking recognizes that what students learn in school does not take place in a vacuum; but rather includes the entire social, economic, cultural, political, and historical context that shapes one's position and existence in the world. In this manner, thinking critically is essential to creating and maintaining a healthy democracy." (p. 81).

Teaching of critical thinking: In accordance with the above features of critical thinking, analogous instruction is suggested.

Brookfield (1991) supports that self-awareness should be developed, for it has a crucial part in critical thinking. The students should acknowledge and examine their own ideas and actions. Moreover, the students should be motivated at the same time as they are made aware of the fact that they are taking risks; the identification of the potential(negative) consequences should be promoted. The creation of networks is important at this point, as networks provide motivation, support, evaluation and can function as informational sources.

The teacher should provide the students with an evaluation of their progress and allow time for the students to reflect on their thinking. The instruction should feature clarity, consistency, openness, communicativeness, specificity, and accessibility. Modelling of critical thinking by the teacher is also necessary.

Adams and Hamm (1994) also discuss the instruction's content. They stress the importance of illustrating to the students that an issue has many perspectives, that it can be investigated in many ways. Analysis of various stereotypes should be made, as well as debate on moral dilemmas should be executed. Moreover, the teachers should shift focus in learning, meaning centre on the learning process, which should be student-centred.

Carlson (1995) is concerned with the evaluation of sources. The author supports that there is too little instruction on how to recognise/evaluate credible sources; even though this

composes an essential part of critical thinking. One of the reasons why there is such a lack, is the dominance of cognitive psychology which ignores the evaluation of the validity of information.

Martin (1992) is engaged in active learning. He argues that the students are taught to be spectators, not participants; this mainly because they learn that science is separate from its objects. No action is included in science, only thought, even though participation requires an effort to identify oneself with the object of study.

Likewise, Martin observes that not all human activities are included in education. He finds it unthinkable that education teaches students to be only observers, instead of what they actually are, meaning doers, performers; they constantly experience things. Thought and action should not be separated if critical thinking is to be transferred to real life situations.

Supportive milieu: This is one of the factors that influence the promotion and demonstration of critical thinking; the challenging approach pays particular attention to it.

Costa (1992) proposes three environmental conditions that enable the intellectual development; a) the school has a common vision -thinking, b) the curriculum aims at thinking, and c) schools and classrooms are independent, in the sense that they convey mutual trust. If those are present, then the author supports that the teacher will be more willing to include critical thinking in the lesson, and will also enjoy teaching it more.

Brookfield (1991) highlights another aspect of the school milieu, namely the protection it should provide against the evoked emotions. Specifically, the critical exploration of previously accepted values, ideas, and behaviours can produce anxiety, as it involves risk taking.

"We may well feel fearful of the consequences that might arise from contemplating alternatives to our current ways of thinking and living; resistance, resentment, and confusion are evident at various stages in the critical thinking process. But we also feel joy, release, relief, and exhilaration as we break through to new ways of looking at our personal, work, and political worlds [...] As we realize these changes, we feel a pleasing sense of self-confidence." (p. 7).

Moreover, carefulness should be paid when challenging the person to get involved in critical thinking. One should intrigue without intimidating or threatening. The people should feel that they are not being attacked, that their worth is recognised and their ideas are respected; their efforts should be supported.

Obstacles to change: Finally, some theorists discuss the reasons why the educational sphere is not receptive when it comes to adopting new attitudes regarding the teaching of critical thinking.

McGrane et al. (1992) characterise the educational system as homeostatic; whenever a change is attempted, the system has a tendency to go back to its traditional state. They argue for a change in the societal values, in order for the educational system to change.

"Hence, due to their own educational experience, lack of education in thinking skills, the emphasis of teacher training programs, and the societal view of teaching as a profession, teachers generally serve as a corrective mechanism to maintain the current system." (p. 339).

Newmann (1992) examines whether it is at all possible to teach high order thinking in the United States and how the barriers can be conquered. He establishes the problem of a) clarity regarding the resources required for high-order thinking, meaning knowledge, skills, dispositions and b) of specificity, when it comes to instruction.

"Research suggests that the failure to emphasize higher order thinking may be due to several obstacles: difficulties in defining higher order thinking and in evaluating student performance; class size and teaching schedules that prevent teachers from responding in detail to students' work; curriculum guidelines and testing programs that require coverage of vast amounts of material; students' apparent preferences for highly structured work with clear, 'correct' answers; and, teachers' conceptions of knowledge that emphasize the acquisition of information more than interpretation, analysis and evaluation." (p. 105).

Summing up, the challenging approach opposes the rigid and objective character of critical thinking by demonstrating that it is context-bound and thus constructed. Accordingly, the skills involved are not of a strictly cognitive-mental nature, but pertain to the social sphere. Instruction should make the students aware of the contextual factors influencing critical thinking and promote the students' physical-emotional side together with the mental one.

1.2.4. Critique of the literature

The present section attempted to draw the picture of the extant critical thinking theories. Two main views were presented; the traditional approach and the more recent reconceptualisations. The main differences between the two lie in the way critical thinking is conceived; either as autonomous and objective, identified by a set of skills and dispositions, or as a human tool bound to the features of the context it is applied in.

Both approaches have strong and weak points, something that reinforces the perplexity of the concept.

On the one hand, the traditional adherence to universally objective criteria used in the evaluation process, threatens the very existence of critical thinking. Isn't it a paradox to expect

students to be critical thinkers, at the same time as we urge them to refer to pre-determined criteria of a rigid character? Moreover, the provision of a specific list of skills necessary for the application of critical thinking, resembles a list of recipe ingredients. Does that not turn intellectual human activity into a mechanistic process, where if certain rules followed, the desirable result is achieved? Does this notion not lead to standardisation, something which again counteracts the very purpose of critical thinking, meaning the examination of the extant standards and norms?

On the other hand, the modern advocates of relativism in critical thinking, regarding both its content and criteria used, carries also the potential of misuse. If the social and moral limits the context poses are neglected, inappropriate -for the extant societal conditions- conceptions like nazism, for example, might have to be accepted, once justified with analogous criteria.

Considering the importance of critical thinking, the clarification of its nature and components becomes urgent. Research projects of an explorative character should be adopted, as the pre-supposition of the components of critical thinking rather adds to the confusion than clarifies the situation. The dominance of cognitive psychology on the field, can also be counterproductive, as seen from the presentation above. Other areas of psychology which do not pertain to the cerebral should be engaged in critical thinking research.

Likewise, concerning critical thinking instruction and assessment, the need for research methods that are more open to the students' and teachers' subjective experience is apparent; students and teachers are the ones directly involved in the learning process. Psychological research could benefit from a co-operation with pedagogical research, as the latter has a longer history in using methods which address the individual in that sense.

The school participants need to be addressed in their natural environment; the classroom activities and the particular ways critical thinking is expressed need to be investigated. An in-depth analysis can reveal the various nuances of critical thinking, as well as the factors involved in its demonstration; for instance, the role of the context.

Finally, it should be stressed that the majority of critical thinking research comes from the United States -actually all of the main theorists presented are American. Acknowledging the different history, culture, and traditions Europe has, more European research on the topic is needed, to compare findings, discover possible differences and reveal new aspects of the phenomenon.

1.3. LEARNING STRATEGIES

The secondary topic the present research is concerned with, is learning strategies; they are closely related to critical thinking. The exact reasons for their inclusion in the study are presented later in this section.

Firstly, a general theoretical account of learning strategies is given, and secondly the relevance of learning strategies to the present project is elaborated.

1.3.1 General theoretical presentation

'Learning strategy' is a concept marked by quite an ambiguity in the cognitive/educational psychology literature. The confusion addresses learning strategy definition, content, instruction and assessment.

With respect to *definition* and *content*, learning strategies have been used in rather different manners. One can refer to their use in connection to particular learning skills, like rehearsal, imaging, outlining; or related to general self-management activities, like planning, comprehension monitoring, and to complicated plans involving specific techniques (Derry, 1990)⁵.

Accordingly, various definitions are in use at present. Pressley, Harris and Marks (1992), for instance, purport that learning strategies are *cognitive operations* aiming at a goal, applied so as to enable one's performance. Schunk (1991) presents learning strategies as:

"[...] *plans* oriented toward successful task performance or production systems to reduce the discrepancy between learners' present knowledge and their learning goal" (p.282; emphasis added).

Independent of the exact definition, learning strategies are commonly divided into three types; *metacognitive* (under planning), *cognitive* (under the process of material analysis), and *social/affective* (under communicative activities). Each type is presented shortly.

Firstly, learning strategies are closely linked to *metacognition*. According to Flavell (see Quicke, 1994), metacognitive knowledge may concern both factual information and information about the cognitive functions, here learning. It reflects self-knowledge about one's cognitive state and learning processes.

Specifically, metacognition includes knowledge about how, when and where to use learning strategies, as well as about the way those strategies are related to each other. In other words, metacognitive strategies include knowledge about one's way of learning, as well as

⁵ See also Turnure, 1987; Weinstein, 1988.

about the task. They thus have an executive function; they are applied under the monitoring and evaluation of one's performance (Du Bois & Staley, 1997⁶).

Secondly, *cognitive* strategies is a term often used to identify various competencies that are considered necessary or helpful for achieving effective learning. They are presented as a series of steps followed in a certain order, so as to complete a learning task (Kline; Deshler & Schumaker, 1992). They include both actions and thoughts, which are employed in order to achieve understanding, memorisation and recall. Not all are observable, as not all involve behavioural acts (Chamot, 1993).

Several attempts to classify cognitive strategies have been made. One of the most established categorisation, is the one provided by Weinstein and Mayer (see Davidson-Shivers; Rasmussen & Bratton-Jeffery, 1997). They divide strategies into five groups; rehearsing, organising, elaborating, comprehension monitoring, and affective cognitive strategies.

Thirdly, the *social/affective* strategies include management of other factors present under learning, such as motivation, attributions of success and failure, stress and emotions. Even if this group has been less explored, the role of those strategies into learning is not doubted. For instance, knowing how and when to apply the appropriate techniques-i.e. cognitive and metacognitive strategies- is not adequate for effective learning; motivation to engage in and carry out the task is also requisite. Besides, the students' perceptions and beliefs about learning and the ability to learn, influence strongly their performance (Pintrich & De Groot 1990). Moreover, knowing how to co-operate effectively under group-work, for example, is another strategy pertinent here (Chamot, 1993). It;

"[...] mainly involve[s] the learner in communicative interaction with another person; for example, when collaborating with peers in problem-solving exercises." (Fleming & Walls, 1998, p. 14).

Even though the content and definition of learning strategies are issues of controversy, the contribution of learning strategies to learning is widely acknowledged⁷.

The significance of strategy use to learning and class performance has been shown through a series of research⁸; strategies enable learners to independently administer their actions and environment (Zimmerman & Martinez-Pons, 1990). Specifically, learning strategies can function as tools for helping the learner to handle the subject matter properly.

⁶ For elaboration on the metacognitive component in those strategies, see Borkowski et al., 1987; Weinert & Kluwe, 1987.

⁷ See also Pressley et al., 1997; Weinstein & MacDonald, 1986.

⁸ See for example Borkowski et al., 1992.

They enable her/him to give meaning to what s/he reads, and contribute to independent learning. This, especially when the direct feedback from others (e.g. teacher) is absent (Ornstein, 1994).

Experience with specific strategy learning programmes has shown that when the students acquire strategies, they become in charge of their learning. They eventually recognise that some strategies work and can be used repeatedly (Edmunds, 1999).

Consequently, application and use of learning strategies is related to better classroom performance (Young, 1996). Metacognitive strategies, for example, contribute to the management of learning, as they enable students to identify their mental processes and actions. Their use allows the students to become independent learners, as they acquire control over their learning.

"Using metacognitive strategies, students are able to learn material faster, understand it better, and retain the information longer. These strategies emphasize the role of the student as an active learner, one who makes decisions about the learning through questioning, self-monitoring, and metacognition [...] With strategy use, learners become active participants as they select information and build schemata, integrating the new material with prior knowledge and past experience." (Mayo, 1993, p. 130 & 132).

Likewise, the notion of a good strategy user implies the acquirement of sets of strategies, the co-ordination of multiple strategies and the ability to switch between them, when necessary. Such assertions draw from research findings on the differences found in strategy use between for example low and high achievers, novices and experts (Davidson-Shivers et al., 1997).

The above body of research suggests the need for *instruction* on learning strategies. Specifically, four main issues are central; *what* to teach, *how*, *where* and *when* (Mayer, 1996). A commonly recognised instructional method has not yet been reached upon.

Briefly, the content of a learning strategy programme (*what*), indicates the dilemma of either promoting a single ability or teaching various skills. The way of teaching learning strategies (*how*) is divided between concentrating on either the product or the process of learning. Another point of debate is whether strategies are general or domain-specific; in other words whether to teach them in a separate course or integrated in other regular courses (*where*). Finally, the most appropriate age to provide such an instruction is also a factor still to be clarified (*when*)⁹.

⁹ For research on this issue see also Ely, 1994; Hattie et al., 1996; Jonassen et al., 1991; Knight, 1993; Porras, 1994; Sawyer et al., 1992; Welch-Marks, et al., 1996.

While a thorough analysis of those instructional issues would be elucidative, what is more pertinent to the present paper are other aspects of learning strategy instruction. Namely the influence of the *teacher* and the *school milieu*, and the case of the students with *learning difficulties*.

Firstly, one of the fundamental requirements for an effective learning strategy instruction, is solid strategy knowledge by the teachers themselves. The *teacher* is initially responsible of increasing the students' awareness of their learning processes by presenting various strategies and by modelling their use (Ely, 1994). Furthermore, the teacher should provide the students with the necessary time for practice, reflection and frequent repetition of strategy use. In addition, strategy employment should be encouraged; at the same time, those attitudes and beliefs about learning that emphasise the significance of the learner's contribution and of the correct strategy use, should be promoted¹⁰.

In that way, the students can acquire the requisite knowledge about strategies; they learn when, how and why they should apply them. Hence, they become motivated to employ learning strategies, once their effectiveness has been experienced. The teacher's involvement becomes gradually less, and the students become able to recognise when to alternate between strategies. They carry the potential of becoming independent learners (Schraw, 1998).

Very often, though, strategy instruction is either absent or not effective, due to teachers' perception and attitudes, among others. Students are often expected to already possess such techniques from the previous schooling years; hence, instruction does not take place properly. Besides, teachers abolish the instruction of strategies when faced with a large volume of curriculum content that needs to be covered within limited time frames (Baumfield & Oberski, 1998; Ornstein, 1994).

"It is evident that 'learning that' is not always necessarily the best way to 'learn how', and that teachers who concentrate on the former may deploy teaching strategies which are inefficient and even counterproductive." (Quicke, 1994, p. 249).

Furthermore, teachers might be actually lacking the necessary knowledge on learning strategies (Duffy, 1993) and might not acknowledge their importance in learning. Teachers' beliefs about what is a good learning result has a lot to say here. Prioritising of the exam goals, which usually urge for rote learning, for example, does not allow strategy instruction. Pure memorisation of facts and incidents provides a very limited number and type of

¹⁰ Correspondingly, a strong relation is found between the conception of what scientific knowledge is and how to acquire it, and the learning strategies employed. In other words, the students' epistemological perspective influences their understanding of learning and instruction (Edmondson & Novak, 1993).

strategies to be taught (Davies, 2000). Similarly, teachers' perceptions of the learning ability itself are also important. When a teacher believes learning ability is inherent, for example, the contribution of strategies is not recognised (see Hamman; Berthelot; Saia & Crowley, 2000).

Besides, the teachers' perception on their own role is essential. An authoritative attitude that does not wish for student participation in the class, unavoidably influences the teacher's willingness to teach strategies, and the number of analogous opportunities for practice. An attitude which holds the teacher and the textbooks as the main legitimate sources of knowledge -instead of a belief that the students can construct knowledge- is also highly counterproductive (Tabulawa, 1998).

Secondly, the *school milieu* should be supportive of instruction and strategy use. A school that promotes independent and active student learning also ensures circumstances for strategy use. Group-work, project-work, democratic class dialogues, individual help and assessment, promotion of learning goals that require independent learning, are some examples. When the teacher's authority is not higher than the student's, when confidence in the student's abilities and healthy competition is promoted, application of learning strategies is a natural consequence (Baumfield et al., 1998; Hostetler, 1993; Karabenick & Sharma, 1994).

Illustrating the above, research between schools with high and low percentages of drop-outs can be mentioned (Bowman & Roth, 1993). The findings indicate that in those schools where the students are motivated and committed to learn, the school administration and staff regard students as being responsible and give them corresponding opportunities. Students are treated equally, independent of their achievement. Moreover, the classroom environment should be built up in such a way that is intriguing, with a clear relation to the real world, hence bestowing meaning to the student's everyday life.

Linked to the above is the issue of learning strategies instruction and students with *learning difficulties*. The last years a respectable amount of research has been devoted to this group of students, as strategy use is considered a way to help them become more efficient learners.

Specifically, students with learning difficulties face problems in strategy development. Research has revealed that they possess a restrained number of strategies, and find it strenuous to adopt new strategies; the metacognitive skills to identify the reasons for non-effective strategy use are absent (Sullivan-Palinscar; Winn; David; Snyder & Stevens, 1993; Swanson, 1993).

Until recently, a common belief was that this group of students is less able to execute learning assignments, due to lower capacity for cognitive processing and due to drawbacks in

learning. Current findings, though, support that the main reason lies in the difficulty those students face in choosing, applying, and evaluating the appropriate strategies while learning.

"Students with learning disabilities, however, do not seem to lack the ability to carry out the learning task as much as they lack the metacognitive strategies to govern their mental processing during the completion of the task [...] it often appears to teachers and parents that these students cannot do the required tasks. This often leads to extreme frustration and, too often, the students stop trying to learn." (Edmunds, 1999; p. 69).

In other words, if students with learning disabilities are taught both learning strategies and the appropriate way to use them, they can improve their performance¹¹.

The issue of correct and effective strategy use is closely related to the issue of self-regulation. According to Zimmerman (1996), self-regulation consists in the deliberate effort to understand the material based on personal experience, and to maximise one's performance. It requires self-motivation to learn, meaning processes such as goal setting and self-efficacy; metacognition, meaning planning of strategies, monitoring, adjustment; and knowledge of learning strategies.

"[...] underlying metacognitive, motivational, and behavioral processes that learners use promote their own achievement" (p. 52).

The initial activation must come from the students themselves; they need to employ cognition, feelings and behaviours that are directed to the fulfilment of academic goals. The way to achieve that is to assume a strategic approach to the various tasks, and to use self-monitoring and perceived self-efficacy. Zimmerman gives a corresponding model of the factors which determine self-regulation (1996). For him;

"[...] self-regulated learners are not only successful in school, they understand, value, and engage in learning in ways that are fundamentally different from externally regulated students. Self-regulated students approach tasks with sense of efficacy, goal-directed diligence, and resourcefulness. [...] When environmental obstacles exist, such as poor study conditions or an unclear textbook, self-regulated learners accept the responsibility and find a way to surmount these problems." (pp. 57-58).

In contrast, the non-successful learners are not aware of whether reading comprehension has taken place; they are not able to convey meaning out of the information. Besides, they do not actually know how to check their understanding or use corresponding learning strategies. They lack self-reflection, cannot perform self-evaluation, cannot detect failure and thus do not take the necessary action to correct it (Anthony, 1996; Ertmer &

¹¹ For research on the issue see Pressely et al., 1993; Vann et al., 1990.

Newby, 1996). In other words, students with learning difficulties are not able to self-regulate their learning.

"[...] underachievers are more impulsive, have lower academic goals, and are less accurate in assessing their abilities. In addition, they are more self-critical and less self-efficacious about their performance and tend to give up more easily than achievers.[...] They are more anxious, have a lower self-esteem, have a higher need for approval, and are more influenced by extrinsic factors than achievers." (Zimmerman, 1996, p. 62).

Consequently, lack of self-regulation influences factors of motivation, as well as success and failure attributions. Constant school failure contributes to the adoption of attributions addressing factors not controllable by the person, such as low ability. In other words, those who believe that their effectiveness depends on external factors and on inherent ability, make less efforts and do not engage into challenging tasks, as they are trying to avoid failure (Bråten & Olaussen, 1998b; Chamot, 1993; Nolen, 1996; Schraw, 1998).

"[...] students' application of appropriate metacognitive strategies is inherently connected with their feelings of empowerment and their resultant willingness to invest the effort necessary to apply strategies for active problem solving and learning." (Meltzer, 1993, p. 102).

Concomitantly, the teachers usually assume the students will choose the basic study strategies on their own -such as time planning, note taking, preparation- so they do not regard learning strategy instruction as necessary. Sometimes, they also attribute the students' difficulties to the lack of ability to learn effectively, and thus do not believe learning strategies are bound to instruction¹².

So far, a general presentation of learning strategies, their instruction and corresponding factors, has been made. What follows is an elaboration of the connection between learning strategies and critical thinking; this, in close relation to the objectives of the present paper.

1.3.2 Learning strategies and critical thinking

In general, learning strategies participate in the employment of critical thinking. They provide the learner with techniques and methods necessary for information collection, information elaboration and evaluation. This process facilitates understanding and leads to the formation of a personal opinion. By using learning strategies while handling information, the

¹² Corresponding research on teachers' perspectives reveals factors that influence the classroom practice; the teachers' assumptions about what is knowledge, their perceptions of the students' role, of the educational goal, etc. (Fleming et al., 1998; Presseley et al., 1997; Tabulawa, 1998).

students are enabled to give meaning to the material, and develop an insight to it. Besides, learning strategies elicit acquisition of knowledge and skills; they provide means of dealing both with information and motivation/affect.

Specifically, learning strategies enable information processing; examples of such strategies are encoding, selection, construction, integration. Metacognitive strategies are also present; they enable self-monitoring and control over the information processing.

All the above pertain to the application of critical thinking; namely when one has to evaluate the information acquired and assume a standpoint to it (Davidson-Shivers et al., 1997). Learning strategies allow students;

"[...] to handle the barrage of information coming from the environment" (p. 250).

A simple example of a specific strategy and its contribution to critical thinking, is the writing of summaries. Writing promotes understanding, improves learning, helps to monitor comprehension and recall, enables organisation (Hill, 1991); all those functions are involved in the application of critical thinking. Other analogous strategies are (Olsen, 1995); identification of main/sub-topics; summary, co-operative learning.

Another important point is that learning strategy mastering reinforces students' confidence about their cognitive abilities and effectiveness as learners. They help them realise their potential; the students become better able to guide their thinking in the direction of the wished goals. In other words, learning strategies contribute to the achievement of self-insight, essential for the demonstration of critical thinking.

"After being guided through the process of generating questions, making predictions, and monitoring and checking their comprehension, our students improved both in their use of a variety of strategies and in the accuracy of their comprehension. They found, to their surprise, that they could do more of their own thinking as they read than they realized [...]" (Gourgey & Earisman, 1997, p. 52).

An elucidative case here is this of the metacognitive strategies (Kaplan & Kies, 1995; Quicke, 1994), which enable thinking about thinking. Those who possess metacognition, carry out conscious thinking, essential in for example new situations and problems that demand careful planning and evaluation. When one is conscious of one's thinking processes, the self is in the centre of learning.

This metacognitive knowledge regards not only mental processes, but also knowledge about oneself and the others (Flavell; see Quicke, 1994); the latter is embedded in a critical thinking process. Metacognitive learning strategies provide both the motivation and the skills

requisite to engage in an investigation. The student is armed with the self-insight that provides security and self-confidence, has, in other words, the motivation and willingness to employ an examination. Knowledge about the self and the others, awareness about the world, elicit useful information about for example possible reasons and influential factors regarding the issues under scrutiny; the person is sceptical and inquisitive, an attitude implied under critical thinking.

"Thus, if a child does not possess efficient learning strategies, knowledge of the world will be diminished. Motivation to attempt academic work might also be reduced, because many academic tasks require much more effort in the absence of effective strategies." (Pressley et al., 1993, p. 356).

Summing up, learning strategies are essential tools for the employment of critical thinking. They provide those techniques necessary and elicit this attitude essential for engaging in and carrying out critical thinking successfully.

Hence, it becomes rather natural to include learning strategies in a study on critical thinking¹³. Their investigation can namely provide information about the actual application of critical thinking; by revealing specific problems the students face with certain critical thinking tasks or by clarifying the reasons why critical thinking employment sometimes fail, for instance.

A more detailed description of what is meant with learning strategies in the present thesis is necessary, especially when considering the obscurity that embraces the field. The study uses the term learning strategies by including both learning and studying techniques; both the methods applied while learning in the classroom and while preparing for exams are implied.

After having presented the basic theoretical framework regarding critical thinking and learning strategies, the context of the present study is elaborated. The Norwegian school Reform -94 and one of the main persons involved, namely the student ombudsman, are now examined.

1.4. REFORM 1994

¹³ For research on the relation between learning strategies and critical thinking see also Gourgey, et al., 1997; Sinclair, 1994.

1.4.1. Background

Norwegian education became the target of intense critique during the end of 1980's-beginning of 90's. The major concerns expressed at the time compose the incentives leading to the Reform -94; those incentives stem both from the educational and the societal arena.

Concerning specifically *upper secondary education*, the following problems were acknowledged (ODIN 1996a; Telhaug, 1997):

- Serious capacity problems were experienced. Not all young people received a place at schools, especially those wishing for a vocational education.

- Upper secondary education was divided into one-year foundation courses and two-years advanced courses. The students had the opportunity to choose various courses from the foundation level, responding to ten studying directions, which lead to the advanced courses, respectively. Nevertheless, not all students were able to fulfil the three-year education, as there were not enough places available in the advanced courses. Thus, many students had to remain at the foundation level for longer time than planned.

- There was too much specialisation from too soon. The foundation level consisted of 109 half-year courses, that were difficult to get an overview of and put a structure to (St. meld. nr. 32, 1998-99).

With regard to societal needs and changes, the following observations were made (Telhaug, 1997; ODIN 1996a):

- There was inadequate contact between school and working life; the employment level after education was unsatisfactory.

- Globalisation and internalisation, together with technological advances set new demands in the working sphere.

- There was a recognition that knowledge keeps changing constantly.

Hence, in summer 1989, the government at-the-time¹⁴ appointed a committee with the assignment to plan a reform in upper secondary education. The Minister of Education, Research and Church Affairs, Gudmund Hernes¹⁵ was a person who played a major role in this reform. He was namely the main influential force in the formulation of both the theoretical basis of the Reform and its practical application at schools (Telhaug, 1997).

A corresponding proposal was delivered to the Storting (i.e. the Norwegian parliament) in 1991, which lead to the Storting report number 33 (dated 1991-92). This included the main objectives and goals of the Reform, which later took the name 'Reform –

¹⁴ i.e. the Labour Party, led by Gro Harlem Brundtland

¹⁵ who operated from November 1990 until December 1995

94', as it was put into practice in autumn 1994 (Telhaug, 1997).

In accordance with the observations presented above, the *general principles* of the Reform can be summed up as such (KUF, 1997-98):

- Education serves both individual and societal needs.
- Education has long-term consequences/results, which are gradually achieved.
- Education is adapted to the individual characteristics and needs.
- Evaluation of one's competence for upper and higher education is based on the person as a whole; recognition of both formal and informal competence shall take place.
- Stronger co-operation between schools and working life is established

1.4.2. Objectives and goals

As presented in the Storting report 33, the main issues Reform -94 addresses, are equal opportunities, structure and learning content (Andersen, 1996). The most radical changes introduced affected the vocational education.

Accordingly, the main objectives distinguish the Reform are as follows (Andersen, 1996; Bergli, 1999; Telhaug, 1997).

1. All youth have a statual *right* to a three-year upper secondary education, of either a theoretical or a vocational direction. This right regards both the opportunity to enter the educational programme and to fulfil it.

Specifically, those that have completed nine years of primary and lower secondary education (in 1994 or later) and are between 16-20 years old, are free to apply on three different studying directions –from the foundation level; they will be given place in one of them. This education should be taken up within four years¹⁶.

In addition, those that have fulfilled their 20th year of age also have the right to higher education¹⁷. The students with a particular need for a specially designed education, who suffer for instance from learning difficulties, have an entrance priority.

Finally, there is the establishment of a follow-up service, which takes care of those young people that do not attend school. The function of this service is to advise those individuals toward receiving education.

2. The *structure* of the training shall secure good progress from one level to the other.

Firstly, the foundation courses are now reduced to 13, instead of 109. Secondly, the students shall not be deprived of the opportunity to follow the advanced courses (advanced

¹⁶ -or 5 when it comes to vocational training.

¹⁷ i.e. 'adult education'

course I and II) after the fulfilment of the corresponding foundation ones.

Specifically, two options are available; an academic-theoretical direction, and a vocational one.

The theoretical direction includes three years of training at school; one year of foundation courses, and two years of specialisation in the advanced courses I and II. It provides university entrance qualifications (ODIN, 1996b).

The vocational training is directed to the future working needs, combining training at school and in a company. The vocational education consists of two years education at school; foundation courses and advanced courses I, and training within a working establishment, as apprentice¹⁸. Specifically, the students could have this final specialisation either under one year of training or under two years of training combined with productive work in business/industry. Completion leads to a craft/journeyman's certificate and other vocational qualifications (ODIN, 1996b).

It should also be noted that the advanced courses I for the vocational education comprise of subjects of both a more specialised and an academic-theoretical character.

Finally, those with a vocational training who wish to acquire a university entrance qualification, can attend a specially designed advanced course II, that gives them this opportunity.

3. New *curricula* for the upper secondary education are introduced; namely the core curriculum and specific syllabuses.

The new core curriculum –which regards primary, secondary and adult education– presents the underlying principles for the learning content and working methods at school. Its most distinctive feature is that it encompasses a broad sense of knowledge which includes aspects regarding both science, the individual and the society. Specifically, in addition to the subject-field, knowledge regards promotion of attitudes and values, as well as development of personal qualities like co-operation, creativity, communication, and social skills. Knowledge shall be of a high level, constituting a basis for education throughout life. A major aspect of it is the ability to create and apply new knowledge constantly, so as to respond to the continuous changing demands of the working sphere (St. meld. nr. 32).

As stated in the 'Upper Secondary Education Act' §2 in the core curriculum:

"The purpose of upper secondary education is to develop the skills, understanding and responsibility that prepare pupils for life at work and in society, to provide a foundation for further education, and to assist them in their personal development. Upper secondary education

¹⁸ This is called 'the 2+ model'.

shall contribute to increased awareness and understanding of basic Christian and humanist values, our national cultural heritage, democratic ideals and scientific thought and method" (Nasjonalt læremiddelsenter [NLS], 1994a, p.1).

The *subject syllabuses* include the main goals and frames for the training content of each subject. Those goals are rather precise, in order to ensure competence concerning knowledge, skills and attitudes. They are divided into modules, meaning various sub-goals comprising of one subject or parts of a subject. This serves the purposes of partly fulfilled education, for specially assigned groups.

The syllabuses also present the general aim of the subject's presence within school, as well as the national professional community attitude and working methods the students should possess. They all include information on the environment and computer technology.

In addition to the core curriculum and subject syllabuses, the Royal Ministry of Education, Research and Church Affairs (hereafter KUF- Kirke- Utdannings- og Forskningsdepartementet), has edited a number of methodical guides and leaflets advising on how the educational goals can be achieved. *Veiviseren* (NLS, 1994b) is perhaps the most central of them, as it presents the basic concepts underlying the core curriculum, such as motivation, planning of learning, and evaluation. The rights of the students are highlighted, and suggestions on working methods are made.

Correspondingly, the *evaluation* of the students' competence shall assess if the pre-determined goals were achieved. At the same time, evaluation is viewed in a comprehensive manner; it shall assess the knowledge in its broad sense (St. meld. nr. 32, 1998-9). This does not mean that the grade system is abandoned, but that evaluation should include also the person's general qualifications. As such, it takes place both on-the-way of the learning process -in relation to both the core curriculum and syllabuses goals- and at the end of it -in accordance with the syllabuses goals (Telhaug, 1997).

In addition, there is a *school-based evaluation*, meaning assessment of the school as a whole; the degree at which school provides the conditions for goal achievement, and the way it carries out the training is where this evaluation is directed. In other words, everyone's work is assessed; the school leaders, office staff, students, teachers. The primary criterion is the core curriculum guidelines. Students play a central role here, as they assess essential aspects of their training; the learning environment, their own degree of participation, the organisation of the learning work. It is each school's responsibility to organise such an evaluation process (NLS, 1994b).

As a last remark, the educational responsibility lies initially in the local authorities; there are 19 counties in the country, with a national Education Office in each. They, in co-operation with the municipalities, are in charge of providing the students with enough places at school, of regulating the school progress, organising the exams and in general of ensuring that the core curriculum and national guidelines are followed by the individual schools (KUF, 1994).

1.4.3. Theoretical analysis

After the above general presentation, certain aspects of the Reform -94 are now analysed further. Those aspects are chosen under the criterion of relevance to the present paper.

a. Thoughts and acts leading to the reform

Looking back at the end of '80s-beginning of '90s, the central ideology pertaining to the school arena is that education should contribute to the development of the society. Promotion of democratic values is emphasised, via the establishment of a common understanding and a sense of community. Culture and traditions should be preserved. Simultaneously, individual responsibility is underlined, not in a pure moral sense, but as recognition of the personal responsibilities addressing the welfare state (Morseth Herzberg, 1998). Respect for the church, the law, and family values is promoted; those together with honesty and hard work comprise the mature citizen (Telhaug, 1997).

At the same time, though, intense critique on the educational system takes place. The authorities state that Norway does not make complete use of the people's capacity; education is of a low standard, and does not satisfy the market's needs. The changes the Norwegian society had gone through, contribute to this concern; from being rural, selective regarding values, and based on norms, it became multi-national, with pluralistic values, and bombarded with information (Aasen, 2000). Therefore, mainly due to changes in the national economy, educational aims should also serve industrial purposes. Competence is necessary in order to function and succeed in a world-wide market, where globalisation and international co-operation are central (Morseth Herzberg, 1998).

Accordingly, school should provide more knowledge to more people, under the effectiveness perspective (Telhaug, 1997). The focus is on the type of knowledge necessary, as the relation between knowledge and economical growth is made clear; life quality is decided by the society, not nature. Critical attitude and independence are emphasised. Specifically, knowledge demands are made for interpretation abilities, due to the rhythm of

information development. Education should therefore provide with skills enabling use of old knowledge for the comprehension of new (Morseth Herzberg, 1998). Theoretical knowledge is also important, but as having instrumental utility; to provide, namely, for the working arena (Skarpenes 1998).

In sum, education is treated as a means to both develop personal qualities and get competition value. School embraces effectiveness, which is measured by the person's opportunity to maximise his/her own abilities and potential (Aasen, 2000).

b. The Reform -94 – Curriculum and goal-management

In accordance with the above observations and acknowledgements, the Reform introduced new curricula. They are characterised as 'goal-management curricula', for the focus is not on the learning content, but on the learning *goals*; they compose the main elements. The primary difference with the previous curricula is that now the goals are something that the *students* can discuss, master and achieve; they are not an object of instruction. In other words, the subject of the curricula is the students, not the teachers any longer (Monsen, 1996a).

The new curricula put weight on a broad sense of knowledge; this is illustrated with the help of six human types, that represent the integrated human as a whole. On the one hand, both general competence and specialisation are emphasised, so as to satisfy the constantly changing demands of working life. The new challenges and conditions are demonstrated, where society and working life mutually influence each other. On the other hand, the development of those qualities that enable students to independently take responsibility for their lives and the others around them are also underlined (Telhaug, 1997). Humanistic, Christian and cultural values and ideals are presented. The final goal is self-realisation, in a way that the common good benefits of (Skarpenes, 1998).

Instruction should therefore be based on the principles the curricula embrace, and not on the textbooks. Hence, there is no concrete guidance on the working methods; the teacher is free to choose his/her own. S/he is responsible for ensuring that the students are given the opportunity to actualise the curricula aims (Monsen, 1996a). The only exception here is the obligatory implementation of *project-work*. All students should complete project-works, and at least one of them should be interdisciplinary. The rationale behind is that this type of work provides students with more independence, and allows active participation in all the phases of the learning process (Telhaug, 1997).

Discussing the new curricula, Monsen (1996b) observes that they contain *contradictions* that create dilemmas in school practice. Their theoretical foundations are

located in management theory -which emphasises concentration on measurement of results in relation to goals. The curricula are thus an instrument to define and evaluate results in relation to expectations. At the same time, though, a wide sense of knowledge is the final goal, something which is not clearly analysed in relation to evaluation. It implies either that attitude and qualities are operationalised and measured -in addition to the subject knowledge- (i.e. goal management), or that knowledge includes both attitudes and personal qualities, for they are inseparable. Due to this vagueness, teachers and students are often facing dilemmas in their everyday interaction.

Along the same line of thought, Telhaug (1997) advocates that the curricula are contradictory in the sense that the educational goals embraced are antagonistic. They indicate promotion of both basic and continuous education; of both individual and community welfare, and so on.

Agreeably, Skarpenes (2000) refers to the tension the curricula create around identity creation; the student is encouraged to follow his/her own will, but within the frames posed by societal and ethical values.

c. Traditional roles under change

Another major consequence of the principles the curricula convey is a re-definition of the traditional teacher and student roles. The emphasis is not on learning a concrete body of knowledge any longer, but on learning *how* to create and apply new knowledge; this poses different demands primarily on the students, as their responsibility domain is enlarged.

A corresponding concept that dominates this rationale is 'responsibility for one's own learning' -hereafter AFEL¹⁹. The main notion is that learning process is a type of *work* which is carried out by the *learner*; the student should be regarded as a professional, who is learning the profession of learning. So 'responsibility' is not used in a moral sense, but it refers to self-activation; it is the condition for effective learning. An essential element here is the existence of a concrete goal to work towards; this goal is defined in relation to the person's previous experience and knowledge (Bjørngen, 1995).

Hence, in order for the students to assume this responsibility, full control of the learning process is required. The students should have the freedom to actively carry out all the phases of the learning process, meaning its planning, execution, and evaluation (Bjørngen, 1995). Subsequently, the role of the teacher becomes this of a trainer; s/he should provide the conditions for effective learning, should guide and motivate the students. The teacher's main

function is to help students to help themselves (Bjørgen, 2001).

However, this role change that AFEL necessitates, meets difficulties within the school realm; even though the majority of the teachers initially agree with the ideas governing AFEL, they are still not willing to abandon their traditional roles (Bjørgen, 2001). According to research findings (Monsen, 1996a; 1999), the main reasons for the difficulties around this responsibility shift are: a lack of a common understanding of the concept 'responsibility' -the teachers state the students are not motivated/qualified to carry out the curricula goals; the teachers lack concrete proposals on how to carry out student participation and the students show no need/motivation to abandon their extant role. Another main argument the teachers have is that more student participation means fewer parts of the subject syllabuses covered; this is considered a serious hindrance, as the final evaluation (exams) still requires specific subject knowledge (Bergli, 1999). As Monsen (1997) put it:

"[...] [an] inherent opposition between responsibility for one's own learning (students' responsibility for individual learning goals) and the curriculum's reality in practice, where teachers believe they must comply with the curriculum goals the way they are formulated, in order for the students to achieve the goals they will be *measured* on, i.e. the exam requirements." (p. 35; my translation; emphasis in original).

In discussing corresponding research results, Monsen (1999) advocates that the teacher and student roles remain the same, because the extant conception of knowledge has not changed. Specifically, according to the traditional view, those who possess knowledge, have a certain authority and power. Teachers therefore guide students into knowledge; common planning and execution has a limited function. Students cannot participate in planning as they do not possess knowledge. On the contrary, as indicated in the core curriculum, the students shall actively seek knowledge by using the knowledge they already possess. They have to learn to ask the right questions and problems, and gather information from the various sources at disposition. The teachers should thus orient students, advise, motivate, and help them to become good knowledge seekers.

Nevertheless, teachers and pupils face difficulties with this new perception. The students believe their traditional role is less demanding, and that it gives them better exam results. The teachers believe the new conception accounts only for the active and interested pupils. Thus, what happens is that new methods are used for the acquirement of knowledge in the traditional sense.

Hence, Monsen argues that if we do not alter the extant knowledge concept -namely

¹⁹ 'Ansvar For Egen Læring'

the pursuit of the absolute truth- then it is difficult to include students in the planning of the learning process. This is actually a major conflict teachers experience; their democratic attitude against the subject's demands.

"[...] it is difficult to assign an important role to the students within planning and executing the instruction, if the instruction's goal is to lead the students in a platonic knowledge universe of 'eternal truths'. In this knowledge universe, the subject's structure and progression is determined beforehand; so what is then the point in discussing with the students what they are supposed to understand before they have even understood what it is all about." (1999, p. 97; my translation).

d. Evaluation of the Reform -94

Together with the introduction of the Reform, KUF initiated an evaluation process, taking place from August 1994 to December 1998. Seven research institutes carried out various evaluation projects on four main Reform areas (KUF, 1997); dimension and capacity, competency, organisation and co-operation, content and application of the training. The institutes were obliged to deliver both on-the-way and final reports. The main research results are presented in the Storting report nr. 32 (1998-99).

In general, no radical changes are registered in those four years of the Reform (Bergli, 1999; Monsen, 1998). Even though most of the teachers agree with the underlying principles and objectives, they are not able to apply them fully. Regarding student participation for instance; only ca. 20% of the students is reported to participate in the planning of the instruction, which is actually translated into either making connections between the curriculum goals and the textbooks (St. meld. nr. 32), or discussing teachers' suggestions (Bergli, 1999).

The reasons are twofold; on the one hand, the *curriculum goals* do not have a clear formulation, so teachers and students do not possess a common understanding (Bergli, 1999). Time limits and individual subject objectives set obstacles to a corresponding dialogue for the clarification of those goals (St. meld. nr. 32). On the other hand, teachers believe the *students* do not possess the necessary qualifications and abilities in order to participate actively in the learning process and thus be responsible for their own learning.

Particular attention is drawn to the weaker students; it is supported that they do not actually benefit from the new situation (Monsen, 1998). Concerns are especially directed to those of a vocational direction; they face big problems with the theoretical subjects, as the connection between theory and practice is not clear.

Moreover, the teachers express doubts about the consequences of their new roles, as they are afraid students will not achieve a satisfactory level of knowledge and the professional

(i.e. subject) status will decrease. Accordingly, the working methods change at a slow rate, even though the curricula are used increasingly (Monsen, 1998).

Regarding the evaluation of the students, no major changes have been observed either. Various difficulties arise due to the vagueness of the evaluation criteria (Monsen 1996a), especially concerning the informal evaluation (Monsen, 1998).

Recent projects reveal big frustration among the teachers, due to continuous hindrances in carrying out their new role. A corresponding survey (Sand, 2000) shows that seven out of ten teachers do not think they will work all the way to pension after Reform -94. A large number of them feels a work overload due to unmotivated students and large amounts of paper-work.

This work overload seems to have affected students as well, and sometimes to such an extent, that medical staff has accused the theory volume introduced with Reform -94 of leading to increased episodes of anxiety, depression and nervous breakdowns among the young people ("Unge alvorlige syke av skolereform", 2000)²⁰.

It is worth mentioning here that perhaps some of the negative reactions were caused by the fact that Reform -94 was organised and applied very quickly in relation to past reforms –it took only three years from the committee proposal to the reform application (Telhaug, 1997). In addition, the curricula were produced and imposed by KUF, something that made the teachers feel left out (Folkestad, 1997).

Finally, a negative predisposition might be also located in that the Reform introduction coincided with a conflict between the teacher organisation and G. Hernes (during 1993-4) about work requirements and wages.

1.4.4. Final remarks

Reform -94 has caused numerous discussions on a wide range of issues. Questions arise regarding for instance, the purpose of education, the role of the teachers and pupils, which type of knowledge is appropriate.

Having said that, it is possible to isolate the most distinctive perhaps feature of the Reform, located at the core of its formulation; namely the existence of contradictions and conflicts in the curricula objectives.

As touched briefly above, the most obvious contradiction is located in the final goals of the education; personal growth together with management of pre-determined goals

²⁰ It should be noted that the pupil and teacher organisations did not agree with the above statement.

(Monsen, 1996a). Free development of personal qualities is encouraged, so that the student reaches self-realisation and becomes autonomous, but only within the frames posed by the society and ethics (Aasen, 2000); group solidarity, a community feeling and attitude are promoted. It thus seems that free identity formation is promoted, at the same time as preservation of the community norms and traditions is urged.

Moreover, the introduction of goal-management curricula, signifies a synthesis of pedagogical theories and market mechanisms (Boman, 1999). Both political and professional forces control learning (Aasen, 2000). The individual is encouraged and assisted to make ultimate use of his/her full potential, where effectiveness and productivity are serving the purposes of the working arena, the current market. As Deichman-Sørensen, Blichfeldt and Lauvdal (1997) eloquently put it:

"On the one side it [the reform] has as a goal to ensure self-activity and co-responsibility from the bottom. On the other hand, this self-activity should work so that pre-decided goals are achieved; goals which are central, defined from above [...] This touches of course an old paradox in pedagogy -the individual should take responsibility for his/her acts, but on the premises of the authority." (p. 133; my translation).

Even though those contradictions can be explained by reference to the rapid societal changes, still, dilemmas around praxis are not ruled out. In addition, the somehow vague way that the goals are written with, contributes to the fortification of the confusion the central participants in the educational system experience. As a result, individual interpretations and adjustments might be in conflict or even opposed to the central decisions as intended (Monsen, 1996b).

It still remains to be seen how and to what extent the above conflicts are dealt with in everyday school practice. Research projects of a different nature are needed, as those evaluating the Reform in its first four years of life have been mainly concerned about an initial description of the various issues in a broad scale, in a general way. More in-depth investigation of clearly defined aspects of the Reform is necessary, so as to elucidate the complex relations between attitudes, actions and effects (Monsen, 1998). The changes introduced with the Reform require adaptation and adjustment over a long period; as Monsen (1998) commented, ten years of reform practice are perhaps necessary to actually be able to reveal clear results.

1.4.5. Reform -94 and critical thinking

As seen above, one of the main Reform objectives addresses the education of the students both at a personal and social level. This signifies the enhancement of abilities and qualities which enable personal maturation and development of a sense of social responsibility.

Moreover, the students are expected to acquire knowledge in its broad sense. They should, in other words, become capable of constructing knowledge and constantly adopting it to the current societal frames. They should develop the ability to acknowledge and respond to the needs of the working life by both making use of their extant knowledge and seeking out new one.

Critical thinking is significant to the actualisation of the above. It arms the student with the necessary tools for responding to the changes and new challenges arising. It facilitates the execution of the individual tasks involved in such a process, by providing for instance the method to handle large volumes of information, to evaluate judgements; it enables the students to arrive at own conclusions. Moreover, critical thinking promotes flexibility in the sense of adjustment to the current circumstances by involving mechanisms of generating knowledge and supporting the adoption of multiple perspectives. Concerning also the personal sphere, critical thinking promotes self-insight and awareness of the societal frames, thus contributing to the harmonious development of the self.

Critical thinking is indeed included in the core curriculum. It is described in relation to one of the human types mentioned above, i.e. 'the creating human being'. The contribution of critical thinking to the new Reform requirements is quite clearly stated:

"Critical thinking implies checking whether the assumptions and the links in a chain of thought hold [...] Education must find that difficult balance between respect for established knowledge and the critical attitude that is necessary for developing new learning and for organizing information in new ways."(NLS, 1994a, pp. 14-15).

In other words, train into critical thinking enables the assuming of the responsibility promoted by the Reform. The students need to learn how to deal with the current demands, to make major decisions and stand for their actions over themselves and the society. Critical thinking appears as an indispensable part of one's education.

"The training nowadays must also include [...] practice of 'crisis competencies', meaning the ability to take action when meeting unexpected difficulties or unknown assignments. [...] The training shall contribute to an education of the character which provides the individual with power to take care of his/her own life, of the responsibilities over the society [...]" (NLS, 1994b; my translation).

1.5. STUDENT OMBUDSMAN

In addition to the previously presented literature, the present thesis uses as a source of information data provided by a person with a rather central position in the school realm, namely the student ombudsman.

Briefly, this position (BDF, 2001a; 2001b; Interview, 2001; Odinarxiv, 1998) was first introduced in 1997, in the 'Norland' county. It addresses upper secondary education, vocational training included. Administratively it belongs to the county board, to which the ombudsman also reports.

The role of the ombudsman is to take care of the students' interests and rights in school, to ensure that everyone is given equal opportunities. The main goal is to promote and ensure the students' active participation and influence in school and their being educated in a holistic manner. One of the central assignments is to promote changes in the school traditions and in the roles of the persons involved.

In order to secure the above, the student ombudsman co-operates mainly with the student councils at schools. Particular issues, like complains about grades, are not part of his/her duties; however, individual students can obtain specific information about training issues and receive advice on how to proceed individually at the school level. In addition, the ombudsman offers corresponding courses and lectures. S/he operates also in close contact with the National Student organisation, and participates in the committees at the county level, so as to influence the authorities. Eventual school failures to apply the extant rules and laws are reported, and analogous recommendations are made.

The student ombudsman carries out county school visits during the autumn; each school is visited for a day, where a course on how to approach various problems is also given. Later in the year, the student ombudsman meets with the leader and co-leader of the city councils, in a period of three-four days, where further training and information on how to handle eventual cases is provided. Furthermore, during the spring, the eight regions of the county are visited, where a meeting with the representatives of the student councils takes place. Other ways the students can contact the student ombudsman is through the internet or by telephone.

The university in Tromsø conducted an evaluation of the role the ombudsman plays, which offered positive conclusions in relation to the assignments taken addressing the change of traditions and roles.

At the time the present study took place, only one person was appointed as student ombudsman in the whole of Norway. Myself together with an Erasmus psychology student conducted an interview with the person in question. All the necessary permission to use the information given and to make direct references to his person, was given by the student ombudsman.

Specifically, the interview addressed central educational issues operating both at a theoretical and practical level, such as; the responsibility of the students within the school frames, students' role and actions, student participation, the core curriculum application, usual problems faced, theory and actual praxis, positions of the students at schools and influential factors, the relation between teachers-students, teacher education, the teacher's role, the teachers' point of view, school goals, administrative responsibility, traditions and roles, school culture, the Reform application, conceptions about the school.

The above topics are considered directly relevant to the present study, as they refer to areas that the study either addresses directly or operates within. The student ombudsman has immediate access to the school reality by being especially in close contact with the students. His experience and knowledge about the actual school activity provides fruitful information that the data can be elucidated with. The interview will be thus used as literature reference²¹.

1.6.THE GOALS OF THE STUDY

The goal of the present study is to investigate critical thinking within upper secondary school, the way it is perceived and applied at the school advanced level I.

Specifically, the goal is to explore the lived experience of the phenomenon; people operating at various stages in the educational system are the focus. The objective is to understand the phenomenon as unfolded from its presentation in the Core Curriculum to the individual student in the classroom. The participants' experiences and role in the application of the critical thinking in the classroom are examined.

A secondary objective of the study concerns the presence of learning strategies at the advanced level I. Specifically, their content and role under the employment of critical thinking are explored. The inclusion of learning strategies in the present investigation of critical thinking, follows the rationale presented earlier.

Finally, the specific questions that guide the research are:

- What is the meaning of critical thinking for the various groups?
- How is critical thinking applied in the classroom?

- Are there differences in the way critical thinking is perceived and applied by the various groups? Is there a difference between theory and praxis?
- What are the contextual factors influencing the experience of critical thinking and the differences detected? What is the role of the school milieu?
- What is the relation between learning strategies and critical thinking? Does learning strategy knowledge influence the way critical thinking is perceived and applied? Are there differences between the groups?

Having stated the goals of the study, a detailed presentation of the method and design follows.

²¹ The whole of the interview can be found in *Appendix*.

CHAPTER 2: METHOD

The present chapter is divided into two main parts. First, the approach adopted and the specific method followed are elaborated, and second, the design of the study is presented.

2.1. RESEARCH APPROACH

The first question that arises when designing a project, is which approach should be adopted, that is, the best way to deal with the phenomenon under investigation.

The chief factors determining the above choice are the *goal* of the research and the *nature* of the phenomenon examined. In the present case, the phenomenon in focus is *critical thinking*, its nature and application; the secondary phenomenon investigated is *learning strategies* and their role in the above²².

The extant research on both critical thinking and learning strategies has dominantly been attached to the quantitative²³ paradigm. As seen earlier²⁴, those two phenomena are characterised by quite a confusion in literature regarding their nature and function. Research findings are inconsistent, even though the importance of the concepts within the educational realm is highly recognised. A generally accepted definition does not exist; rather, the literature points toward the need of clarifying the concepts further. The quantitative instruments²⁵ used have received a considerable amount of critique over the last years, with regard to reliability, validity, and generalisability issues²⁶.

²² Even though the examination of the method is mainly done in relation to critical thinking, the secondary phenomenon investigated -*learning strategies*- is not ignored; learning strategies are examined more in detail, when corresponding information is considered necessary to illustrate the points made.

²³ By 'quantitative' here is meant the dominant psychological research approach, which adheres to the positivistic paradigm of science.

²⁴ see Chapter 1

²⁵ The Watson-Glaser test (Watson & Glaser, 1980; see McDonough, 1998) is one of the 'established' critical thinking tests used nowadays. Other most commonly employed tests are: the Cornell Critical Thinking Tests (Ennis & Millman, 1985; see Frisby, 1991), Ennis-Weir Critical Thinking Essay Test (Ennis & Weir, 1985; see Kennedy et al., 1991). LASSI (Weinstein, Palmer & Schulte, 1987; see Deming et al., 1994) is one of the most commonly used instruments for the assessment of learning strategies. The other most used strategy assessment inventory is the Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich, McKeachie & Smith, 1989; see Garcia & Pintrich, 1996). It was developed to assess a) motivation and b) use of learning strategies among college students.

²⁶ For critique on critical thinking instruments see Frisby, 1991; Karlsson, 1993; McDonough, 1998; Walsh et al., 1997; Weinstein et al., 1985. For critique on learning strategy instruments see Bråten et al., 1998a; Deming, et al., 1994; Olaussen et al., 1999; Oxford, 1996; Rahilly, 1993; Vizcarro et al., 1996.

Briefly, current research does not offer a satisfactory account of critical thinking. Hence, the adoption and use of an pre-constructed definition and theory of critical thinking is rejected. This way of proceeding would be counterproductive to an in-depth investigation of the phenomenon as present at schools, as there would be no guarantee that the theoretical alternative chosen is actually the one pertaining to the basis of the research.

Thus, the main issue becomes to adopt the approach which allows the unfolding of the nature of critical thinking and of the way it is applied in the educational area; the *meaning* critical thinking conveys for the participants is significant. The most appropriate manner to investigate that, is by focusing on the participants' own experience of the phenomenon. In other words, the *individuals' perspective* and their *experience* of critical thinking are the departing point.

2.1.1. The individual's perspective

The significance of the individual's perspective has been previously illustrated in educational research.

Some of the most recognised researchers in the domain of learning, learning strategies and thinking, are T. Garcia and P. R. Pintrich. They have been arguing for the significance of *students' perceptions*, among other elements that deserve attention in the educational arena. In corresponding work (Garcia & Pintrich, 1996), they examine the techniques used to assess cognitive and motivational components in relation to classroom performance; interviews and observations are included. They emphasise the need of examining students' own perceptions of the task and themselves, as those perceptions influence cognitive, motivational and affective factors.

"[...] it is very important to also collect data on students' perceptions and beliefs about that task and their behavior, not just the behavioral indices that can be generated from observational data." (p. 320).

Subsequently, they present alternative ways of assessing the above, for example self-report measures²⁷; they state that self-reports carry a primary significance in that they

"[...] help us decide if *any* cognitive or metacognitive strategy use is taking place." (p. 322).²⁸

Similar research literature on learning matters that uses techniques and instruments which elicit the individual's perspective has been examined²⁹. Selective examples of such

²⁷ The authors further examine the use of self-assessment reports in relation to developmental and validity issues.

²⁸ Similar arguments on the issue of motivation and students' perception can be found also in Nyikos et al., 1993; Schutz et al., 1998.

²⁹ See Davies, 2000.

research are given here, so as to underline the importance of acquiring data based on the individuals' perspective.

Accordingly, there is an emphasis on the need to focus on students' self-perception as a means to acquire valuable information that could not be accessible otherwise; for example, when using a quantitative instrument. Elen and Lowyck (2000) advocate that research with in-depth interviews on instructional interventions can reveal factors that other methods cannot. The authors underline a fact which has been neglected by quantitative research, namely the importance of the students' *interpretation* of the instructional intervention; it is not simply the intervention itself that determines its success. Elen and Lowyck use a questionnaire with essay-type questions (i.e. open-ended), designed to discover the general characteristics of instruction and to get reactions on various instructional environment examples. The results include information on the elements considered essential in instruction: qualities of instruction (e.g. what characteristics the teacher should possess, what functions s/he should carry out), instructional environment (e.g. important factors, relation to learning behaviour and outcomes), instructional elements (e.g. use of example, example of exam questions).

"[...] the students' conceptions of the relationship between aspects of instructional environments, or specific instructional interventions, and their learning, determine how, and to what extent, interventions are used." (p. 421).

Commenting on the same issue, Giorgi (1985c) stresses that in quantitative research, the researcher identifies major variables which are tested and later explained; they are considered as 'real'. Nevertheless,

"[...] the products of the researcher's analysis are placed 'realistically' into the situation and are presumed to operate precisely as he conceives of them. Thus, the real is first constructed, and then these same 'constructs' are used as explanations for the 'real' performance data, yet we never actually know what 'really' happened because the subject's entire perspective and the experiment's total presence to the situations are not brought in as legitimate data." (p. 41).

Likewise, Udall and High (1989) discuss the use of self-perception³⁰ in the assessment of critical thinking. While examining the instructional value of programmes for teaching thinking of a high level, the authors observe that such evaluation is usually carried out by either general critical thinking skills tests or a constructed instrument. They however emphasise that those tests do not actually assess the thinking processes employed by students. Udall and High conducted a study that examined the behaviours of students and teachers

³⁰ The research on students' conceptions of learning began with Perry in 1970 and with a phenomenographic approach. It resulted in a categorisation of conceptions of learning (see Eklund-Myrskog, 1997).

during a critical thinking course. The research methods used are lesson-videotaping and interviewing.³¹ The questions posed regard teacher expectations, thinking process, understanding, behaviour and mental activity during the lesson.

In a parallel manner, the investigation of students' and teachers' perceptions can reveal beliefs and attitudes toward learning issues, which are significant factors when evaluating and designing learning programmes.

Correspondingly, Nyikos and Oxford (1993) assert the importance of revealing what the students believe about language learning, as this affects their motivation, the way of learning and in turn their use of learning strategies. They found for example, that students who believe that the teachers are the primary source of knowledge, do not employ self-directed strategies during language learning. Besides, those who believe language learning comprises in memorisation, use of grammar or translation, also avoid using learning strategies.

Knowledge of such factors plays a key role in the success of a teaching method or programme. Rabren and Darch (1996), for instance, studied the strategies employed by students with learning disabilities. The focus is the investigation of the reasons for which the students with learning disabilities choose certain strategies and for which they do not accomplish reading comprehension. Unstructured and structured interviews were used³² in order to examine teachers' and students' perceptions of analogous behaviour. The results obtained are considered important to the design of instruction that can help those students³³.

Similarly, Tabulawa (1998) applied a case-study approach to reveal the teachers' perspective in secondary education regarding classroom practices (i.e. school knowledge, aims of education, instruction, learning) in Botswana. She argues for the need to 'hear' the teachers' thoughts, as;

"[...] disregarding what the teacher *knows* and *thinks* about his or her own classroom practice when effecting change may lead to disappointing results." (p. 250; emphasis in original).

³¹ The subjects were two middle-school teachers, who planned a 20/30 minute lesson on a thinking skill and five students from each class. The analysis that followed revealed over 50% agreement between teachers' intentions and students' perception.

³² Two groups were interviewed: students suffering by learning difficulties, and general education students, as well as one teacher from each group.

³³ For similar research on use of strategies by successful and unsuccessful users, see Loranger, 1994.

Hence, in-depth interviews and observations were conducted³⁴. The data was analysed within the grounded theory approach³⁵. The advantage of such methods is that they can provide;

"[...] an accurate portrayal of the realities of teaching in its natural or conventional setting, something that cannot be attained in studies largely adopting quantitative research methods." (p. 254).

Tabulawa underlines the significance of revealing the teachers' perspective by stating that the subjective element is strongly present at school practices. The meaning of those practices has to be understood, in order to discover possible problems and employ changes. Personal assumptions and experiences, thoughts and beliefs interact with observations; practice is influenced by a combination of those.

Along the same line of thought, Davies (2000) conducted five semi-structured interviews with six teachers, who tried out assessment material for a specific school subject in classes of 11-14 years old. The aim was to reveal;

"[...] one source of difference in teachers' practice of differentiation." (p. 194).

Specifically, the researcher investigated the teachers' adaptations and use of the assessment material; the students' work; and the relation between assessment materials and their usual practice. The analysis focused on: the teachers' own explanations for their adaptation of the material and students' performance in comparison to the teachers' expectations; the teachers' explanation for labelling one's work better than others'; and the description of what ability in each school subject means. The results reveal which aspects of practice and thinking are related to the teachers' beliefs regarding differentiation.

Finally, research on teachers' and students' perceptions can also contribute to the establishment of better communicational patterns in the classroom, when the results obtained are made known to both groups. Reid and Johnston (1999), for example, examined what 'good teaching' is according to both students and lecturers using a phenomenographic approach³⁶. The results reveal the significance of knowing each others' perception on teaching matters:

"[...] in their efforts to improve their teaching, staff need to be informed by greater sensitivity to student perceptions, and that to facilitate their learning students need to be more aware of why particular teaching techniques are preferred by their teachers." (p. 280)

³⁴ Three teachers were studied, over a two month period.

³⁵ i.e. by Glaser & Strauss, 1967; see Tabulawa, 1998.

³⁶ Phenomenography investigates the phenomena with the aim to uncover their various expressions. The founder of phenomenography is F. Marton (see Giorgi, 1999a).

In sum, the significance and contribution of the individual's perception in research - generally in psychology and specifically in the field of learning- is acknowledged within the scientific circles. Accordingly, centring on the individual's experiences of critical thinking will elucidate the concept.

Hence, qualitative research will now be examined more closely; it is within the realm of this approach that the individual's perspective becomes the centre of the research.

2.1.2. The choice of the qualitative approach

The qualitative research paradigm/approach in its an established form is approximately thirty years old (Giorgi, 1992). Numerous of discussions have been conducted around its prospect, methods and scientific status. For the purposes of the present paper -which focuses on the experience of critical thinking within school- this discussion will be limited to psychology, and particularly to educational psychological research.

In general, the goals that qualitative research serves can be epitomised (Ambert, Adler, Adler & Detzner, 1995) in the in-depth investigation of the experienced world. Qualitative studies attempt to answer questions about how and why regarding human behaviour and thinking by providing knowledge regarding both structure and process. Such research addresses mainly the context of discovery, as opposed to that of verification.

Specifically regarding qualitative research and the educational domain, Jansen's (1995) report is of great relevance. He gives an account of the extant educational research on 'whether and how schools make a difference'. He argues that quantitative research has failed to provide clear answers on the issue, as the perspective adopted is not in accordance with the educational reality.

He bases his critique mainly on the difference in emphasis on school *effectiveness* (quantitative, e.g. research between the relationship of textbooks and achievement) and school *quality* (qualitative, e.g. school and classroom processes and achievement). Specifically, he emphasises that the quality of education has to be directed to the investigation of the process of teaching and learning. This, Jansen concludes, by using in-depth qualitative approaches and by emphasising the internal perspective of the schools. In other words, emphasis should be given on *why* and *how*, instead of what and how much.

In the same line of thought, Säljö (1986) -one of the main researchers within educational psychology- delineates the goals and purposes of educational research, and elaborates the research approach to be assumed. He states that the goal of research within the educational arena is to examine the extant methods of teaching/learning and to discover new

ones³⁷. Accordingly, he criticises the view that considers generalisation the main aim of research; he draws attention to the fact that in order for generalisation to be useful, the *context* should be made clear. In other words, we should talk of *context-dependent generalisations*, since then the persons involved (teacher-student) can compare the others' situation and predict/assume how it would be in their own case.

Hence, descriptive (qualitative) research is necessary;

"[...] to obtain careful and detailed descriptions of specific instances of the teaching and learning that go on in schools [...]" (p. 121).

Säljö urges the clarification of the commonly used concepts in the educational arena (e.g. project-work), which are not actually clearly investigated; they are used without any clarity about their practical implications.

Within this frame, the importance of the students' perceptions of school instruction is underlined, as the majority of the previous research has not taken them into account.

"One voice is noticeably missing -that of the student. We feel that students' perception of instructional practices are essential to the success of inclusive efforts because students' perceptions will directly and indirectly influence teachers' behavior." (Vaughn, Schumm, Klingner & Saumell, 1995, p. 236).

Specifically, qualitative research on learning considers students' perceptions and experiences as the major informational source for the assessment and improvement of educational programmes. As Rahimi (1995) put it:

"[...] if one wants to see which conceptions students have of a particular phenomenon, how they approach their learning tasks, what their conceptions of the educational context are, how they experience their university education, or other second-order questions, for that matter, one has to seek the answers within the students' own opinions regarding these issues." (p. 34).

Corresponding research illustrates the application of such qualitative methods and techniques on the construction of models that help students manage their learning better³⁸ and it has come up with results that challenge the extant established theories (e.g. Derry, 1992).

Subsequently, qualitative research addresses the in-depth investigation of learning issues by taking into account the personal experiences and perceptions of the participants; it thus provides research data with the potential to uncover unknown aspects of the phenomena under investigation. This type of result is indispensable to the delineation of school reality. It namely enables direct access to the classroom situation as formed by the very school

³⁷ He talks specifically about Sweden and mentions that there is a great distance between the formulation and conception of the research problems and the corresponding educational changes.

³⁸ see for example the 'self-regulated learning model' by Zimmerman & Martinez-Pons, 1988.

participants. The knowledge of the specific way students and teachers experience learning and instruction issues provides the framework for describing classroom reality in an immediate way, by being based on real experiences rather than pre-constructed theories. The participants themselves are the most reliable source of information regarding learning within school.

Within this frame of thinking, a qualitative approach is believed to be prolific for the examination of critical thinking. It is considered capable of revealing how critical thinking is experienced at schools, which is the net of factors operating under critical thinking application and what is the role of critical thinking in learning.

Even if the general qualitative frame for the research is established, the specific qualitative method to be applied needs to be elaborated.

2.1.3. The meeting with phenomenology

A plethora of theories, techniques and methods that claim to operate within the qualitative realm are available. A systematisation of the qualitative methods remains incomplete, despite the classifications attempted. The task of organising those methods is quite strenuous, as many of them do not always have a clear framework. Not all provide a theoretical basis; the actual techniques used are sometimes a combination of various techniques, in some cases both qualitative and quantitative.

A rough categorisation is that of interpretative and descriptive methods. My educational background included both; out of scholar reasons, I lean more toward the latter. For me, interpretation raises perhaps more questions than it answers. The analysis that follows, will hopefully make this point clear.

I first learnt about phenomenology during my training in psychology. The approach attracted my attention due to its original clarity and solid foundation.

What now follows is first a presentation of phenomenology as a philosophy, and then A. Giorgi and the phenomenological psychological method.

2.2. PHENOMENOLOGY

Phenomenology originates from continental Europe (Cloonan, 1995), from around 1900, when Husserl publishes his 'Logical Investigations' (see von Eckartsberg, 1998a).

The term comes from the Greek word *phenomenon* –i.e. 'that which shows itself, appears'- and *logos* –i.e. structure. Hence, phenomenology is **the structure of a phenomenon**.

The founder of phenomenology, Edmund Husserl (1859-1938) was German, born in Moravia (Czechoslovakia) from Jewish parents. He started his education as a mathematician and logician. Later he turned to philosophy, under the influence of the philosopher Franz Brentano.

According to Husserl, phenomenology is a science aiming to reveal the way objects are experienced and presented to consciousness (Spinelli, 1989); hence, Husserl is the most fundamental representative of transcendental phenomenology³⁹.

Husserl's approach actualising the above is the '*phenomenological method*'. He did not actually invent the method (see Spinelli, 1989), but developed and elaborated it in a way that it became a solid philosophical procedure guiding his thinking. The method has as a focus the phenomena of consciousness and their contribution in the construction of meaning, as a manner by which to get to know reality.

Phenomenology is thus both a theory and a method; without ignoring the volume of Husserl's work, I will briefly refer to some concepts belonging to both parts. The presentation following is based on works by Giorgi, 1971a, 1975, 1983, 1986a, 1995, 1997, 1998; Karlsson, 1993; McIntosh, 1997; Spiegelberg, 1975; Spinelli, 1989; von Eckartsberg 1998a, 1998b; von Knorring-Giorgi, 1998.

2.2.1. Phenomenological philosophy

For Husserl, phenomenology is;

"[...] the science of the essential structure of consciousness"
(Spiegelberg, 1975, p. 248).

The content of phenomenology is **consciousness**, which is the foundation for knowledge. Phenomenology provides a presentational theory of consciousness, as being directly aware of the world. Consciousness can be described as;

"[...] the medium of access to whatever is given to awareness"
(Giorgi, 1997, p. 236).

³⁹ The other nuance of phenomenology is existential phenomenology/existentialism, which is based on the works of Heidegger (Husserl's university assistant). Transcendental phenomenology focuses on consciousness and its structure, while existentialism on the individual's reality, on the individual experience of existence (von Eckartsberg, 1998a). The roots of existentialism are Kierkegaard and Nietzsche.

The **acts** of consciousness are directed at objects; hence, consciousness also bestows **meaning** on the objects. This meaning varies according to *how* the act presents it⁴⁰.

Two important concepts are involved at this point:

a) Intentionality

It is considered to be the essence of consciousness. It refers to the fact that consciousness is always directed to an object, that is not consciousness itself. Consciousness reaches to the stimuli and gives meaning to it. In other words, there is always a relationship between the world and our experience of it.

Specifically, by stating that consciousness is directed to an object that is not itself, two options are created:



<p>1. Transcendent object: an object that is outside consciousness (e.g. a glass). This is a principle of openness: because of consciousness, people are open to see something else than themselves, the world.</p>	<p>2. Immanent object: an object that belongs to the same total consciousness (i.e. when people reflect on themselves/on their consciousness, for example a memorial object)⁴¹.</p>
--	---

Every object of consciousness always *transcends* the act in which it appears. With the term '*transcendental*' Husserl means external, the objects of consciousness that;

"[...] are 'transcendent' to it, are intended or meant" (Spiegelberg, 1975, p. 73).

For Husserl, a phenomenon is what appears to a *subject*; without subjectivity there would be no phenomenon. In other words, subjectivity always intends objects or phenomena. That notion puts an end to the separation of object – subject, as it relates the being of an object to a subject. For example I can go back to a memorial object (my actions this morning) again and again; as the object does not change, it must be independent of the act⁴². Without

⁴⁰ Husserl was opposed to the common view held at the time, that general concepts are a result of abstraction; he advocated that consciousness experiences directly general features., which are not abstracted from the experience (see Polkinghorne, 1986a).

⁴¹ Consciousness in that case is the object of consciousness; the intentionality thesis is still preserved because consciousness as an *object* transcends consciousness as *act*.

⁴² Subsequently, many psychological phenomena are made available to analysis; the acts of consciousness are intimate, but the objects are shareable since the object transcends the act in which it appears.

consciousness, a phenomenon cannot exist! Subsequently, it is inter-subjective experience that decides what is objective experience, by pointing out certain types of it.

The acts of consciousness are called **noetic** acts (*noesis*); what consciousness points at, are the **noematic** objects (the perceived, *noema*). Noema is;

"[...] the intentional correlate of each act (noesis). It is the object as meant, as intended." (Karlsson, 1993, p. 68).

In other words, the experienced object is noema; the state/mode of experiencing is noesis, i.e. the how through which we experience the object, how we give meaning to the experience⁴³.



In order to make the above clearer, there are many ways for consciousness to be conscious; and the object appears in various profiles. To be rigorous, Husserl describes the intentional relationship in terms of noesis-noema. Noesis means 'act' and noema means aspect of an object. Accordingly, we can sense, perceive, desire or remember the colour of an orange, its smell, the way it feels, our urge to eat it, or even remember picking it up from a tree. The interest of phenomenology lies in the noetic-noematic relationship –an act intending an aspect of an object.

Finally, the acts of consciousness are able to synthesise, meaning that when we see an object, we see only perspectives of it, but still experience it as a whole⁴⁴. The same regards each act individually.

b. Intuition

This is the function of consciousness. Intuition means being *present to*. In other words, the fact that consciousness makes the world present, is the **intuitive function** of consciousness.

There are types of intuition, according to the *quality* of the object presented:

	
<p>a. Experiential /empirical objects: Objects in <i>space, time</i>, governed by <i>causality</i> = the real (e.g. a glass)</p>	<p>b. Ideative objects (essences): Irreal, the object is NOT in space, time, causality (e.g. the number 7)⁴⁵.</p>

⁴³ This is unique for each one of us, without of course excluding the fact that common socio-cultural environments allow sharing of experiences.

⁴⁴ See Spinelli (1989) for more information on the issue.

⁴⁵ Accordingly, empirical sciences are engaged in facts and eidetic sciences in essences.

Consciousness deals with **presences**, and not existences. Phenomenology is thus a philosophy of intuition. What we call *experiences* here, is the intuition of real objects. In other words, intuition includes experience; the latter is only a type of presence.

We thus arrive at **phenomena**, which are the presence of what appears in consciousness, what are given to us, *exactly as experienced*. Phenomenology deals with the presences as experienced, with the meaning they have for the one who experiences them.

To sum up, phenomenology is an intuitive and strictly descriptive discipline which bears the future of intentionality and which is concerned with the man's consciousness (Kockelmans, 1973). It seeks the fundamental facts of knowledge by studying the phenomena, without any presuppositions about the relationships concerning them; it is restricted to the phenomena *description* (Lyotard, 1991).

2.2.2. Phenomenological philosophical method

This is a method of accessing consciousness and its objects, of accessing the phenomena of human experience. What remains constantly in focus in the phenomenological analysis, is the meaning of the object strictly *as given*. The object's presence counts as such only for the one who is experiencing it.

The phenomenological philosophical method consists of **three steps**: reduction, description, and essence.

a. Reduction

Husserl is the inventor of the present step. According to him, people live their everyday lives, their routine, without having any self-conscious awareness of this happening. Put differently, people take for granted sides of the human life, do not question them. From a philosophical point of view, this attitude of the people in everyday life is 'naïve'; the life-world (*Lebenswelt*) is characterised by naïveté. This is what is called the **natural attitude**.

The life-world is called naïve, as things do not just exist, neither are simply what they appear to be. We accept without examining the existence of the world. This, in contrast to a philosophical standpoint, which is reflective and explicit. We ignore the fact that when we see an object, for example, we also grasp its structure (e.g. we see this particular table and its essence).

"[...] this pre-reflective life-world entails essentially such characteristics as temporality, spatiality, personal embodiedness, and intersubjectivity." (Ashworth 1999, p. 708).

Philosophical phenomenology does not take the world for granted; its purpose is to examine the genesis of things. Phenomenology carries out a critical examination of the life-world, in order to come with its essence/structure. Husserl is concerned about the constitution of the object, of the meaning and of the world in general, rather than taking for granted that 'this is the way things are and have always been'. Phenomenology attempts to comprehend how phenomena came to be as such.

In other words, phenomenology is an attempt to go back to the everyday phenomena of the world we live in, to return to the things as they are. It is concerned with connecting philosophy and knowledge, engaged in investigating philosophical questions of the everyday world by moving to the immediate, to the lived experience (Natanson, 1973).

However, in order to understand the life-world better, we must break from the 'natural attitude'. This is achieved with the help of the phenomenological *reduction*, i.e. the description and examination of things and events as a *presence*.

The point of difference between the reduction and the natural attitude lies in the fact that one withholds claiming that the object *is* as it appears; instead, what one says is that;

"[...] the object *presents* itself as such and such. Thus, if I am perceptually present to a real table, within the phenomenological reduction I would say 'the table presents itself to me as a really existing table'. That is more rigorous than saying 'it is a real table'." (Giorgi, 1997, p.240; emphasis added).

This is called to *withhold the existential affirmation*, and it stresses the difference between presence and existence; the researcher makes claims only about the *presence* of the experience.

Another requirement of reduction, is that one has to bracket all his/her past knowledge about the phenomenon in question, so as to be totally present to it as appeared within the *specific* situation, to be able to confront it freshly. In other words, the researcher uses his/her stream of consciousness and not the knowledge about the phenomenon, s/he uses the act side of it.

In summary, the researcher brackets his/her previous knowledge about the phenomenon in focus, in order to examine it without any presuppositions and then, since the objective is to reveal the sense of the experience, the researcher has to avoid making any kind of claims about it.

Schematically seen, the two requirements of reduction are:

- | | |
|--|--|
| 1. To bracket knowledge about the | 2. Withhold existential affirmation: make |
|--|--|

phenomenon under investigation, i.e. both theories and personal knowledge. Use the stream of consciousness and not the knowledge about the phenomenon.	knowledge claims about <i>presence</i> only and NOT existence. Take in consideration the particular <i>context</i> .
--	--

Concerning the first part, Ashworth (1999) indicates that there are two main groups of presuppositions that need to be bracketed: any theories and findings which stem from the traditional research approach, and validity claims which stem from the world -i.e. judging what the person says as correct or not. We study the life-world in its own terms.

Regarding the withhold of the existential affirmation, we do not state that 'things are' but that 'things are presented as'. In other words, we cannot ask any questions about 'why' the person experiences things as such while in the phenomenological reduction; we are distancing ourselves from the 'real', the opinions of the majority.

b. Description

Once having assumed the phenomenological reduction, the second step is to *describe* the phenomenon. Description means to express via language the object of an act, exactly as it appears. Since the analyst does not have a direct access to the stream of consciousness of the person experiencing the phenomenon, s/he is limited to what is given; with the help of description s/he gives an innate account of the phenomenon. The researcher does not go 'behind' the phenomena to explain them, s/he merely describes them⁴⁶.

c. Essence

The target of the analysis is to present the **essence** (*eidos*) of the phenomenon under investigation. Essence is the constant meaning for a context, the meaning of a phenomenon that makes it what it is.

The essence is discovered by employing what Husserl called the **free imaginative variation**. This signifies that the researcher alters aspects or parts (the descriptive features) of the phenomenon, tries to find its possible instances. This is achieved by adding or taking away parts of the particular example of the phenomenon (Polkinghorne, 1986a). Once applied, free imaginative variation helps to reveal the constant features of the phenomenon, the *invariant*. These constant features cannot be removed, since that would change the

⁴⁶ This is one of the main differences between Husserl's phenomenology and the other nuances of phenomenology. The tradition stemming from Husserl is descriptive; the interpretative tradition pertains to Heidegger. Interpretation uses a perspective which is imposed from outside.

meaning of the phenomenon; they constitute its essence.

To sum up, the phenomenological method consists in that the researcher employs the phenomenological reduction and describes the object exactly as it presents itself. With the help of the imaginative variation, the researcher arrives at the core of the analysis, which is the discovery of the phenomenon's essence, its invariant characteristics.

2.2.3. Phenomenology within psychology?

Phenomenology as a philosophical field has a close connection with the human sciences; it seeks to find what is actually experienced by the person, through the description of the experience. It reveals the essence of the objects, which is the fundamental meaning in the human sciences (Lyotard, 1991). Phenomenology conveys the connection between the subject and the situation through intentionality. Its general aim is to understand as good as possible the genesis of the 'natural attitude', meaning the usual attitude that people have in their everyday interactions.

In order to understand the connection between phenomenology and psychology, Husserl's view on the issue is now briefly presented.

At the time of his education, Husserl attended some lectures by W. Wundt, which did not though, engage his interest. Husserl was actually opposed to 'psychologism', the psychology of his time, when psychophysics and psychophysiology placed the psyche within a biological framework, and examined it, accordingly, via the experimental method established by Wundt (Spiegelberg, 1975).

Husserl believed instead, that the main relation between phenomenology and psychology consists in that they are both concerned with the exploration of consciousness, however in different ways. He viewed phenomenology as a form of inquiry of the basis of all sciences.

Husserl does not have systematic work on phenomenological psychology to offer. We only have notes of some lectures he gave with the title "Phenomenological Psychology"⁴⁷. The implications, however, from work in general, are that phenomenology is essential for psychology, as the latter pre-supposes a number of concepts -such as perception, function, act- which are most often not explicitly defined and explained⁴⁸. Husserl used the term 'phenomenological psychology' to indicate an investigation of the foundation of psychology,

⁴⁷ Husserl, 1925/1928; see Spiegelberg, 1975.

⁴⁸ Cognitive psychology, for example, is not unified, there exist various assumptions and methodologies, the findings vary. There is not one theory, not an adequate model of human behaviour (as opposed to machines), no reference to the emotional part of decision-making.

of the basic concepts that underlie psychology. Phenomenology questions these very established concepts by attempting to provide with psychological definitions, by giving their essence.

In other words, phenomenological psychology examines the foundations of psychology so as to acquire a better understanding of them. However, it does not reject other psychological systems or deny their achievements; it claims to examine their foundation. The phenomenological psychology findings usually challenge the established theories. As opposed to cognitive psychology, for example, which pays unilateral attention on the noema, phenomenology underlines the *relation* between noematic and noetic in the intentional acts. As such, it;

"[...] might prove to be of the greatest benefit to cognitive research in general." (Spinelli, 1989, p. 177).

Phenomenology, hence, pertains primarily to philosophy; in order to use it in scientific work, certain transformations should take place (Giorgi, 2000b).

There are more than one researchers that have applied phenomenology within various areas of psychology. One could name C. M. Aanstoos, F. J. J. Buytendijk, R. von Eckartsberg, G. Karlsson, J. J. Kockelmans⁴⁹ as some of the best known in the field.

However, the most acknowledged researcher among them is A. Giorgi with his *phenomenological psychological method*. This is the method I have chosen for the present project, for reasons which will unfold during the following presentation of A. Giorgi's work.

2.2.4. Amedeo Giorgi

The transformation of the phenomenological method to the psychological one has been taking place over a period of more than 25 years; certain alterations have been made, in order to make phenomenology possible to work at the scientific level; without, though, losing the character of phenomenological investigations.

Before advancing to the actual method, some information about A. Giorgi, his conception of psychology and his research needs to be given. As such a presentation can take unfortunate dimensions for the purposes of this paper, a selection has been made.

First, I will draw from Cloonan's article (1995), for a brief introduction.

Cloonan compares the four approaches that have chiefly influenced phenomenological psychological research in America, amongst which A. Giorgi's method.

⁴⁹ See 'References' for more information on these authors' work.

Giorgi's main inspiration comes from Husserl, Merleau-Ponty and the early Sartre (Fenomenologi, Fenomenografi och Hermeneutik, 1998b). His approach⁵⁰ is that psychology is a *human science*. That implies that since science emerges from the everyday world, it should return to it; psychology should go back to the lived experience.

In presenting psychology as a human science, Giorgi elaborates on what the 'psychological' is. The main point is that the psychological is engaged in understanding the way that the objects of the world are presented to consciousness, always in relation to subjectivity, meaning the individual⁵¹. In other words, the psychological is employed in the discovery of the meaning the lived experiences convey for the individual. The qualitative analysis of meaning is the method to access and understand the phenomena psychology deals with. Giorgi (1995) contends that;

"[...] psychology is concerned with the individuated, subject-dependent construals of meanings that belong to concrete, everyday situations." (p. 37).

Establishing the character of this human science, Giorgi contrasts it with the natural science by discussing for instance the concept 'causality'. He illustrates that causality is incongruent with the human phenomena, as the latter involve consciousness. Accordingly, the goal of natural science –control- is not relevant in psychology. The phenomena that belong to human science are not characterised by the same exact, well-defined constituents that pertain the physical objects. Hence, mathematical concepts are not applicable in that case⁵². Schematically seen, the above difference consists in the subject matter involved:

NATURAL SCIENCES	HUMAN SCIENCES
Subject matter: nature / things	Subject matter: person in situation

The focal point becomes the *intentional relationships*. In other words, *meaning* is what should be the principal guiding human science research. Psychology's interest lies in the organisation of experience and the meaning it has for the person who experiences it (Giorgi, 1989c).

⁵⁰ By 'approach' Giorgi means "[...] the fundamental viewpoint toward man and the world that the scientist brings, or adopts, with respect to his work as a scientist, whether this viewpoint is made explicit or remains implicit" (Cloonan, 1995, p. 109). In other words, it is a way to identify, formulate and deal with a research question (Giorgi, 1999a). As such, it includes both a paradigm and its implicit sources.

⁵¹ For an elaboration on the matter see Giorgi 1982; 1993.

⁵² A comprehensive elaboration of human sciences, the meaning-creating subjects and a subsequent critique of the concepts of validity and reliability as presented within the empirical paradigm, can be found in Polkinghorne, 1986a & 1986b; Salner, 1986; Shapiro, 1986; Wertz, 1986.

Concomitantly, a *psychological perspective* according to Giorgi (2000a), is closely related to what is human, as we talk about psychology being a 'human science'. A full description of the 'human' cannot possibly be given, but;

"[...] one could say, minimally, that a human being is an embodied being bearing a consciousness-spanning temporality that is capable of grasping the world in an intelligent way and of bestowing meaning upon it, and of entertaining and creating a network of relationships with others, the world, and itself and of manifesting spatial, temporal, symbolic, and value relationships as well." (p. 65).

Specifically, Giorgi (1985b) describes the psychological as being located between the logical and the biological. Briefly, that means that psychological objects are not simply characterised by the presence of life (biological), neither by pure logic and forms (logical). Psychological beings both possess the ability to form opinions and make statements about the self and the environment, and are more ambiguous as;

"[...] they participate in time, worldliness, and embodiment in a more intimate way than ideal objects do." (p. 52)⁵³.

Returning to Giorgi's opposition of the experimental model, the latter seeks to find cause-effect relationships that do not give but one aspect of the relationship encountered between phenomena. The establishment of this cause-effect pair provides an external point of view, whereas what should be of interest in psychology is the internal point of view, the meaning the phenomena have for people. Hence, psychology can be labelled as 'science', for it provides knowledge about humans, with an understanding as accurate as possible. Besides, prediction and control are not possible, as human freedom interferes in human actions and interactions. Likewise, statistics do not give us psychological meaning, but probabilistic differences. Quantification is concerned with the subject's measured behaviour, and not with *lived* meaning.

Discussing further the traditional experiments, Giorgi stresses that a research situation pertaining to natural science is exclusively designed from the experimenter's point of view; the subject of those sciences (i.e. physical objects) lack consciousness. The mistake of adopting such methods while studying the human is that the latter is conceived as responding to the environment in the same way as physical objects do⁵⁴. We should not ignore the unique characteristics and qualities humans possess; the focus of research in human sciences should be the way people experience situations and live through them. That does not exclude

⁵³ More information on the issue can be found in Giorgi, 1986b.

⁵⁴ This departs from Merleau-Ponty 's saying that behaviour differs from things and ideas: The things in contrast to people do not possess a perspective on themselves and the world (Giorgi, 2000a).

measurement as a means; it rather indicates that measurement should be accompanied with other methods, as other kind of questions need to be asked.

Moreover, this quest for meaning should not be confused with the meaning of measured behaviour, for example, that the traditional psychology carries out. As Giorgi elaborates;

"To understand the meaning of behavior one must understand its functional significance, and in order to understand the functional significance of any behavioral act one must understand its relationship to the whole. By means of accurate description one can render explicit exactly how any behavioral act fits into the context of a situation and thus discover its meaning." (1985b, p. 53).

To sum up, the main differences between natural and human science, as Giorgi delineates them (1971c), are:

NATURAL SCIENCES

HUMAN SCIENCES

Experiment

Other forms of research

Cannot reduce everything to quantity

Interest of psychology: in *meaning*

Analysis & synthesis

Explication

Clarification of meaning

Determined reactions

Meaningful responses

Identical repetition

Invariance through variations

A brief elaboration of the above follows:

- quantity-quality → the main emphasis on quantification originates from the natural sciences, not because it is more rigorous, but because it is more useful there, due to the nature of the objects investigated.

- measurement-meaning → Giorgi presents measurement as

"[...] the kind of *description* that is most suitable for answering the quantitative question which is characteristic of the natural sciences." (1971c; p. 20).

Qualitative questions urge the discovery of a suitable method which can provide with description. The question of how to measure a phenomenon becomes a question of *what is the meaning* of a phenomenon.

- analysis-explicitation → Giorgi uses the latter to describe the process of bringing forth the meaning of a phenomenon within its horizon/context.

- determined reactions-intentional subjects → the response of humans carries their intentionality with it. This response comprises of the meaning the stimulus conveys for the person, in addition to the features of the stimulus.

- identical repetition-essential theme → accurate repetition is not the aim in human sciences; the point is rather to discover the main essence, that comes again and again in the phenomenon's variations.

Now that some fundamental Giorgian views have been described, a detailed presentation of his method follows.

2.2.5. The phenomenological psychological method by A. Giorgi

As mentioned above, the philosophical method went through some basic modifications, in order to apply it to psychology.

The most important change is that the descriptions of various phenomena are obtained by others, from the perspective of the *natural attitude*, and not by the researcher him/herself. This is an attempt to avoid the possible objection of bias⁵⁵, as people are not all phenomenologists, and thus *do have* the natural attitude.

Secondly, concerning the phenomenological reduction, the only claim that the researcher can make is that the specific experience is an indication of what was *presented to the subject* rather than that the specific description is an objective presentation of what actually happened. In other words, the researcher gets in the state of reduction, assuming a certain perspective, having a certain phenomenon as focus.

Finally, when it comes to the discovery of the essences, what is revealed is the most invariant meaning for a *context*, depending on the researcher's perspective. The essences are more contextualised and viewed from the *discipline's perspective*.

Those changes are now elaborated further in a description of the specific steps of the method:

⁵⁵ A self-description can indeed be justified phenomenologically, but considering the strong positivistic dominance, it would be highly time and energy consuming to make it acceptable (see Giorgi, 1989b).

1. Collection of verbal data → the aim is to acquire a detailed and precise description of a specific experience from a subject. For that purpose, a straightforward description, an interview, or both are conducted. Concerning the interview, the questions are open-ended, giving the subject the chance to express his/her experience with the most possible freedom.

2. Reading of the data → reading of the whole description occurs, with the aim to acquire a general impression, to grasp the general sense of the description. No further analysis or thematisation is done. The researcher assumes a holistic attitude.

3. Meaning units → the researcher returns to the beginning of the description and reads through it once more, with the purpose of delineating the 'meaning units' of the experience, guided by a psychological perspective. The latter implies that the division of the description is done based on psychological criteria, by containing a psychological disposition toward the specific phenomenon described. Every time there is a transition in meaning, a separate meaning unit is marked.

4. Transformation units → this is a direct expression of the psychological insight that the meaning units embody. It is accomplished via *reflection* and *imaginative variation*. The presentation is done not by use of the established psychological language, but of the everyday one, seen from the perspective of phenomenology.

5. The structure of the phenomenon → the psychological structure comprises of the essences and their relationships; it is the synthesis of the transformed meaning units as a whole, addressing the specific experience. All of the transformed meaning units should be present in the structure⁵⁶, which serves a communication purpose among peers. *Free imaginative variation* is present at this step, as well.

The above steps need further clarification:

Collection of verbal data. The main criterion for a description or an interview to be accepted as legitimate data, is that it is *faithful* to the experience. The researcher asks for a *specific* situation, because otherwise we will get themes and not context.

Descriptions are considered valid in phenomenological research, for they are articulations of what is presented to consciousness. The important element is the *way* that subjects experience different things. The nature of the experience can only be revealed in relation to the way in which it was experienced; thus, we need descriptions from subjects.

Reading of the data – meaning units. Phenomenology operates within the context of discovery, it is open to the meanings to emerge (Giorgi, 1985a)⁵⁷. Meaning units are considered to be *constituents* as opposed to elements; they are, namely, *context-laden*. The researcher is thus open to the data, reads it and lets the meanings emerge. There is no pre-specification of what to look for. However, the meaning units do not have an independent existence; they are in relation to the researcher's attitude (Cloonan, 1995). In the particular case, the researcher must adopt a *psychological attitude*.

The explanation of what a psychological attitude consists of, is a strenuous task. As seen above, psychology as a discipline is not unified, in the sense that it comprises of different branches that define concepts in a different way⁵⁸. Nevertheless, Giorgi attempts a clarification of his perception of a psychological attitude (Giorgi, 1985a). It is partly translated into that the researcher acknowledges that the psychological reality s/he works within does not exist in the world as such, but is established by him/her. That means that the psychological perspective is much smaller than everyday reality, less complex; this implies that the same description could yield different or other results seen from an anthropological, sociological and so on perspective⁵⁹. In other words, the researcher sets some kind of limits – i.e. the focus of the investigation- in order to make claims about a small part of reality.

However, the actual procedure of getting into a psychological attitude is still an unresolved matter; this is similar as asking what the meaning of psychology is. It is namely the case of something being practised, without having being clearly determined. The psychological attitude is expressed in the way the psychologist discerns the meaning units, the articulation of the transformation units and so on. Nevertheless, one could say that the basic expectation of a psychological attitude is the investigation of the way a person experiences situations and acts in them. Hence, what the researcher looks for, are issues relevant to the specific phenomenon and the particular interest or perspective.

⁵⁶ In the sense that their meaning should be at least implicitly included.

⁵⁷ This opposed to the context of justification, where one seeks to verify pre-constructed hypotheses (Giorgi, 1986a).

⁵⁸ In psychology (Giorgi, 1985b), there does not exist a common understanding of the various terms used, e.g. mind, experience, behaviour. Nevertheless, a science must be able to articulate its object; the latter dictates the method to be adopted. Consequently, there are difficulties in defining the disciplinary status of psychology. Those difficulties be epitomised in the lack of unity (theoretical and a connection between the sub-fields), the presence of separate attitudes concerning the professional and scientific part, the conflicting wish to be both scientific and faithful to human characteristics. The main problem lies in the fact that psychology is called the science of behaviour or experience, without having defined clearly what the latter are and consequently, without having adopted an appropriate research method.

⁵⁹ This is why sometimes different opinions emerge regarding the same data; still that does not mean phenomenology cannot be practised. The same situation is met in therapy for example, where a unitary consensus on what it actually does not exist; however, therapy is still practised.

For instance, the analysis of a data set on the experience of attending written exams at school. If the researcher is interested in the *emotional* features of the experience, the analysis will be quite different from the one carried out by a researcher who focuses on *learning* issues.

The psychological attitude, then, and the specific research interest and goal, is what determine the specific manner with which the meaning units will be delineated. A shift of meaning from such a psychological point of view is translated into a new meaning unit.

Transformation units. Every scientific analysis involves some kind of transformation. Here, the delineated meaning units become transformation units. This should not be confused with a pure thematisation; the method is not a content analysis (Giorgi, 1985a). The experience is seen as a whole; things are not experienced as themes (Giorgi, 1989b). We are dealing with constituents, and not elements.

The present step comprises of a spontaneous procedure, in the sense that the researcher uses the free imaginative variation and makes original discoveries (Giorgi, 1989a). The researcher creates as s/he analyses, does not follow a predetermined process. Free imaginative variation is used here as described previously in the philosophical method. The researcher alternates features of the data, in order to arrive at the meaning conveyed. Again, the specific attitude and interest of the researcher are the chief determinants of the expressed meaning.

The language used in this procedure is not the established psychological language. This is due to the fact that there does not exist one commonly accepted 'psychological' jargon; the extant terminology is closely linked to the various psychological perspectives (Giorgi, 1985a). Psychology does not have a well-established status for it includes various theories and methods, which provide short-term and contradictory findings (Giorgi, 1995). Use of such a language would indicate adherence to a particular psychological branch. As phenomenology is a-theoretical, that would oppose the method's grounds. Instead, everyday language from the discipline's perspective, and within phenomenological premises is employed (Giorgi, 1997).

The structure. The final goal of the analysis is to arrive at the phenomenon's structure, its *logos*. The method provides results regarding the intentional relationship between the subject who experiences and the object of experience (Karlsson, 1993). In other words, the researcher brings the phenomenal to the phenomenological⁶⁰.

Free imaginative variation is employed in this step so as to discover the *invariant* meaning of the examined phenomenon. This meaning presents itself to *the researcher's*

⁶⁰ Here is a difference with natural science; the latter aims at providing facts, whereas in human science, we try to provide meaning.

consciousness and not to the subject's; as such, it is intertwined with the assumed research attitude.

Returning to the aforementioned example, we are concerned either with the structure of the *emotional* part of attending written exams, or with the structure of the *type of knowledge assessed* with written exams.

The structure is the interrelation between the phenomenon's constituents. If one part changes, then the structure changes as well. If all parts change, but the relationship remains the same, then the structure does not change (Giorgi, 1998). It should be underlined here that we do not talk about abstraction; we arrive at a general level through the concrete expressions. In contrast, abstraction would mean application of predetermined criteria on the data (Giorgi, 1985a).

We can arrive at two structure levels: the *situated* one -which refers to the specific experience- and the *general* one -which refers to the experience free from the particulars of the concrete situation, but always context-bound (i.e. the structure can be for more situations pertaining to similar context) (von Eckartsberg, 1998b).

Moreover, the needs and purposes of the research determine the level of generality of the structure (Giorgi, 1995). If, for example, the objective is to help individuals that share similar experiences, a detailed manner in which to express the structure is needed; there are different levels of discourse to choose from. A table, for example, can be described either as a furniture or as a material object, depending on the structure level (Giorgi, 1994).

Usually, the desirable thing is to use more than one subject descriptions in order to construct a structure, and it is likely that a single study will come up with more than one structure for the specific phenomenon. In other words, several sides/variations of the experienced phenomenon are usually revealed within the same research project.

Finally, the structures obtained can be used in order to comprehend the individual variations (von Knorring-Giorgi, 1998). The structure of the experience gives knowledge about the phenomenon that was not present before; we can go back to the variations, examine them and make interventions, based on this typification of the experience (Fenomenologi, 1998a).

Commenting generally on the analysis phase, we should keep in mind that the researcher operates within the *phenomenological reduction*.

On the one hand, that means that the researcher brackets extant theories about the phenomenon, so as to confront it freshly. Indeed, the researcher operates with the cultural-

historical frame, but this is not equal to carrying pre-suppositions and hypotheses. The latter would be what Karlsson (1993) for example calls theory:

"[...] an explicitly defined hypothetical construction." (p. 96).

The fact that the researcher is a socio-cultural being is thus not ignored; it is recognised that all knowledge is in perspective, but at the same time it is underlined that not all perspectives are theoretical. In other words, when phenomenology is applied, a certain perspective is assumed, but no theory is adopted. Theory brings in assumptions that could be independent of or prior to the experience itself. Here, we are limited to the evidence.

Reduction should hence not be confused with obliviousness regarding the existing world. As Giorgi (2000c) put it;

"One is certainly not prohibited from making statements about the external world from within the reduction so long as one does not make statements about the 'beingness' of the world or carry over judgments based upon the natural attitude into the phenomenological reduction."
(p. 8)

On the other hand, recall that reduction requires also a *withhold of existential affirmation*. Description is the articulation of the intentional objects of experience/consciousness, strictly the way the object presents itself in the act⁶¹. In other words, the researcher remains within the *constraints of presentational evidence*, -the data (Giorgi, 1992). Going beyond the data is considered speculative.

Commenting on the possibility of achieving the above, Giorgi (1985c) uses an example pertaining to psychological therapy: the client describes an illusion, which the therapist knows is an illusion, but accepts it as experienced real by the subject⁶². Hence, the researcher might have other experiences with the specific phenomenon than what described in the data, but remains within the latter's bounds. The interest is not do uncover a 'universal truth', but to discover the *meaning* of the phenomenon for the one who experiences it.

It should be further clarified that phenomenology refers to the *lived meaning*, i.e. the relationship between the fact and the person. People are not always aware of the meanings they express, so that is why such an analysis is necessary. Merleau-Ponty (see Giorgi, 1989a) talks about the difference between the fact of living *through* something, and the meaning you

⁶¹ Phenomenology advocates that analysing the 'thing' is different from analysing the 'thing as perceived' (Giorgi, 1995). The latter indicates relations to space, time, causality. It is not correct to say that the chair is identical to my perception of the chair. Things cannot be identified with the perceptual acts, as the latter change over time. The thing I perceive consists of many profiles.

⁶² So actually after the analysis, I assume the natural attitude again, to explain and discuss the findings.

have *lived through*. Just because one has the experience, does not mean one is best to give meaning or sense to it⁶³.

The above does not imply that the researcher is in a superior position; the equality between the subject and the researcher is preserved (Giorgi, 1989a). However, the self-reflection and the reflection carried out by a researcher convey a different perspective (e.g. the particular goal of the researcher, the interest etc.). In other words, the experience of the subject occurs at a pre-reflective level, whereas the uncovering of the experience's meaning requires reflection from the researcher's side⁶⁴ (Giorgi, 1986c). The researcher is the one who designs the research situation; the subject provides data, and the researcher bestows meaning to it. Hence, the roles assumed by researcher and subject are different. We seek *descriptions* of experiences and not interpretations. The subject cannot give a *psychological* interpretation of the data.

This is also why going back to the subject for verification of the results is not legitimate (Giorgi, 1994). The articulations offered by the researcher are bound to be criticised by other members of the community that belong to the same discipline⁶⁵. The subjects of the study are not phenomenologists themselves, they are not familiar with the researcher's perspective, and thus not in a position to verify the results, in that sense. Again, this has to do with specialisation, and not with the persons being incapable of analysing!

To sum up, the phenomenological psychological method consists of five inter-related steps that lead to the structure of the investigated phenomenon, always seen from the researcher's perspective and in close relation to the interest of the particular study.

2.2.6. The scientific status of the method

Assessing a method with the objective to determine its scientific status requires criteria that pertain to the specific nature and features of the method. With regard to quantitative research, indeed clearly determined and established evaluation criteria exist, to which each specific method has to answer. However, when it comes to *qualitative* research, the situation is not as clear.

The fact that qualitative research belongs to a different realm than quantitative is

⁶³ This can be better understood when considering clinical therapy. The clients often go to therapy in order to find the meaning of their experiences/actions.

⁶⁴ This is the difference also between analysis in everyday life; the latter is most of the times naive, less rigorous.

⁶⁵ Giorgi gives here a vivid illustration: this is also happening with for example factor analysis; no researcher goes back to the subjects and interrogates whether the final reduction to some factors is correct. S/he presumes that not all -if none- of the subjects can follow the mathematical model and procedure applied to the initial variables.

commonly acknowledged. The main differences between the two approaches regard their epistemological and ontological claims. Those have clear consequences for the researcher's role, the kind of data collected and the method of analysis applied. It is thus a natural consequence that the *assessment* method and criteria employed should also be of a different kind⁶⁶.

As much as this way of thinking makes sense, the reality is quite different. The majority of the established scientific community does not employ evaluative criteria of a separate kind, in order to evaluate qualitative research, but makes use of the extant quantitative criteria. The incompatibility of those criteria with qualitative research leads to the consideration of the latter as non-scientific; the dominant quantitative adherents do not accept qualitative research as being equal to theirs, and hence a variety of problems arise.

Specifically, as Giorgi (1985c) maintains, the main criteria used to evaluate psychological findings and research stem from the natural sciences. However, research on verbal learning for example, has shown that this type of criteria might not always be in agreement with the research reality, or might not address all the parameters involved⁶⁷.

As vital as this point is for qualitative research, its analysis falls outside the realm of the present project. Thus, only a few general comments will be made, along with the evaluation of Giorgi's method.

One of the reasons why qualitative research does not have its own evaluative criteria is a lack of systematisation; as mentioned previously, qualitative research embraces numerous well and less-well defined techniques and methods, a fact that makes the establishment of common evaluative criteria a perplexing task.

Nevertheless, there is a common agreement between the advocates of the qualitative approach that separate guidelines are needed. Ambert et al. (1995), for example, advocate that the main criterion of evaluating qualitative research with, should be its contribution to scientific knowledge. The evaluation should not be carried out according to the reviewers' epistemological view, but rather based on separate qualitative guidelines.

Some specific attempts toward that direction have been made. Elliott, Fischer & Rennie (1999) tried to establish guidelines for evaluating qualitative research within

⁶⁶ As Mohanty for example states (see Giorgi, 1986c), descriptive science calls for evaluative criteria of a different kind than those used by other philosophical systems.

⁶⁷ i.e. what the researcher considers as 'stimulus' might not always be experienced as such for the subject. In the article given as reference, Giorgi shows in detail that phenomenological research brings forth issues that are either left out by the traditional research on verbal learning (i.e. Ebbinghaus), or not considered to play an important role in the experiment situation. For a relevant and more detailed presentation on serial learning and meaning, see Giorgi 1971a; 1971b.

psychology. They have come up with seven general guidelines, generally applicable to qualitative research. Those address issues such as the presence of the participants' perspective, the clarification of the study context, the explication of the process followed, the success of communicating the results.

Elliott et al. underline the aim of qualitative research to understand the phenomena under investigation by taking into account the perspective of the subjects. Indeed, there are many variations concerning research goals, but a common element underlies all; the attempt to provide *understanding* and not theory.

"[...] emphasis is placed on the particulars of human experience and social life by taking into account matters such as history, language and context that relativize the knowledge gained to the individuals and situations studied and to those doing the inquiry." (p. 217)⁶⁸.

Giorgi agrees: separate criteria are necessary. The scientific status of the phenomenological psychological method should be discussed under a new framework of science. A different conception and interpretation of science is needed; i.e. human science. The scientific value of the method can be demonstrated only when the philosophy of science pertaining to human sciences changes.

Accordingly, the criteria Giorgi uses to evaluate his method, are founded in a phenomenologically conceived theory of science (Giorgi, 1985c). The meaning of this will be unfolded along with the evaluation.

Initially, Giorgi *does not reject science*; he only rejects the natural science criteria used within human sciences. He rather appeals to the traditional criteria of science, but not the quantitative ones. He acknowledges that there are differences between qualitative and quantitative research, but at the same time stresses that they both operate within the bounds of science⁶⁹ (Giorgi, 1999b).

Specifically, two groups of criteria are employed; scientific and phenomenological criteria (Giorgi, 1989a; 1989b; 1997)⁷⁰.

Regarding the *scientific* criteria, Giorgi indicates that science is the production of knowledge. In order for such knowledge to be accepted as scientific, at least four conditions have to be satisfied (Giorgi, 1995): the knowledge has to be systematic, methodical, critical and general. The conditions are clarified as follows:

⁶⁸ That does not exclude the generalisation across situations.

⁶⁹ Quantitative research for example uses 'validity', but that does not mean that validity belongs to quantification; it pertains to Science.

⁷⁰ It should be added here that the method also satisfies psychological criteria, as the researcher has a psychological perspective and reveals psychological essences (as opposed to philosophical ones).

Scientific knowledge →

Methodical	Systematic	Critical	General
A method that can be followed by a number of people, so that <i>intersubjective</i> claims can be made	The various parts of knowledge should be <i>related</i> to one another (example: how learning is related to motivation, and those to emotion)	1. I challenge the claims I make (evaluation) while analysing 2. Publication to the scholar community	It should not be limited to the situation where you got it from, within the frames of the <i>context</i>

The method satisfies the above four *scientific* criteria, as:

- It has clearly defined steps, open to others beside the researcher, than can be followed in order to access the phenomenon.

- It can be applied in the investigation of the various parts of knowledge that psychology is concerned with; due to intentionality, the objects of interest are presented to one's consciousness, and are thus accessible.

- The analysis phase is a constant dialogue/verification between the researcher's claims and the data. The results are published, thus open to assessment by the scientific community.

- The structures the researcher arrives at are *context-dependent*. We are talking about *constituents* and not elements.

The *phenomenological* criteria are satisfied as well, since the method (Giorgi, 1989a): a) is descriptive, b) makes use of the phenomenological reduction, c) uncovers the essence of the phenomena and d) functions under the intentional relationship between a subject (that experiences) and an object (of experience)⁷¹.

I would like to comment further on point a. The method is descriptive at two levels (Giorgi, 1985c): firstly, the data consists of *experience descriptions* obtained from subjects, and secondly the researcher *describes* the structures discovered.

Various discussions have been conducted within the scientific circles on the issue of using descriptions as a legitimate research means, both as a data and as results. As Spinelli

⁷¹ It is worth mentioning here Wertz & Aanstoos's -two researchers that have been engaging into learning research for more than two decades- statement on the phenomenological criteria: "Phenomenological criteria are stricter than those of quantitative research in that all empirical data as well as all imaginable data must be

eloquently emphasises (1989), first we experience something and *then* we can give a description of it; simultaneous experiencing and description is impossible. Thus we refer to 'reflective' experiences, which comprise of the after-interpretation of our experience.

Accordingly, the descriptive model of science serves better the purposes of psychology (as a human science) (see Giorgi, 1986a). Psychology is interested in providing with knowledge on the experience or behaviour. Phenomenology is an eidetic science, meaning concerned about the essence of experience. Hence, description is the pertinent source of knowledge.

Giorgi (1986c) specifies that the problem with accepting descriptions as legitimate data is rooted in the dominance of the positivistic/empirical approach, which emphasises sensory-perceptual physical responses. In phenomenology, we are to understand phenomena precisely as they present themselves, even though we acknowledge that what is given might include more than is apparent⁷². As humans feature intentionality, they are not of the same qualities as the physical objects. Hence,

"[...] phenomena such as believing, wishing, perceiving, etc., and their objects should be used as exemplars." (p. 13).

We are looking for meanings, not facts. Meaning clarifies quality, as measurement clarifies quantity. Analogously, in natural science we have mediation with the form of instruments; here we have mediation with language. Giorgi points out the paradox with language (1986c); it is necessary to science, whereas at the same time it is setting limits to it. Meaning that the description of a scientific instrument through language is a necessary and accepted procedure, whereas, in contrast, data consisting of descriptions taken from people are considered untrustworthy.

Another objection to the use of descriptions is the requirement of being general, as opposed to the individual descriptions obtained in phenomenology. The answer is that we use the individual descriptions as a *departure* point; the final aim is the discovery of the general aspects of the phenomenon, their essence.

After having presented how the phenomenological psychological method satisfies the evaluative criteria, as seen from a phenomenological point of view, a brief discussion of the traditional criteria of science now follows. Such a presentation is inevitable; a) for the dominance of quantitative research poses a threat to the method's status and b) in order to

consistent with knowledge statements, which must be substantiated not merely in a probability estimate concerning the aggregate but in each individual case." (1999, p. 293).

⁷² A good example here is the optical illusions: we know they are illusions, but can still experience them as such.

appeal to more general qualitative criteria⁷³. The criteria also used by quantitative research will thus be discussed, but viewed as pertaining to *Science* and not to the positivistic paradigm. In other words, a *phenomenological* view on them is being employed.

Firstly, the concepts of validity and reliability are examined. A legitimate sense of validity and reliability exist for qualitative research also. The concepts convey a different meaning than the one located within the quantitative approaches (Giorgi, 1988); there the terms are used in relation to the presuppositions and context of logical-empirical philosophy. Instead, we have to determine what is the criterion for making knowledge claims.

Validity in phenomenological research is secured with the employment of the phenomenological reduction and the intentionality thesis. The reduction allows the phenomena to present themselves as they are; through bracketing the researcher avoids influencing the results.

The meanings present to the researcher transcend his/her consciousness, they are *not* in consciousness. That constitutes the control of whether they arise in somebody else's consciousness as well (Giorgi, 1989a):

"If the meanings are rather *for* one's consciousness, then they can be for another as well." (p. 84; emphasis added).

In other words, what is possible for one, is also possible for others. The way the researcher arrived at the results can be communicated and described.

"The researcher analyzing descriptions in a phenomenological way is actually registering meanings as they appear to a reflective mode of consciousness and they should be present to other researchers just as directly if the procedures are sufficiently specified." (Giorgi, 1986c, p. 17).

Closely related to the issue of validity is the issue of using other researchers as *judges* for the results obtained (Giorgi, 1989a), something that Giorgi opposes. He claims that if a judge performs an analysis, then we are left not with a phenomenological judgement, but with an empirical one; to agree with the researcher does not suffice for the evaluation of the method. In other words, the judges check if the themes given by the analyst fit the data, i.e. whether the transformation units reflect the meaning units⁷⁴.

Moreover, the approval of the transformation units is done via reference to the

⁷³ However, it should be noted here that the criteria given by other qualitative researchers are not phenomenological, and thus not necessarily in agreement with Giorgi.

⁷⁴ This is what Giorgi means by an empirical control, i.e. "[...] this checking up on actual transformation or factual achievements [...]" (1989a, p. 76).

meaning units. As seen above, the transformation units are factual achievements that pertain to the study limits set by the researcher. As such, they are examples out of many possible expressions that the meaning units could take, depending on the perspective and goals of each study. In the case of a judge trained in phenomenology, we have a validity verification in the logical-empirical sense, but still that is not a guarantee that there does not exist another judge who comes up with different results. Besides, and more importantly, the use of a judge is unnecessary, as with the application of the free imaginative variation, the perspective of the other is included. As Giorgi put it,

"[...] the imaginative variation should range wider than empirical variations." (1989a, p. 77).

We should also keep in mind that what we have is structures, i.e. totalities and not single elements; the structure conveys the understanding of the data as a whole. The final judge is the academic community.

Reliability is understood as adequate description of the essence given to consciousness (Giorgi, 1988). Reliability is seen in relation to the data, the *content* of the description. If the essence given to the researcher's consciousness is adequately captured and described and can be used constantly, then we have reliability. The proof here is to go back to the data protocols and show how one arrived to the transformation units/structure. Hence, we are dealing with reliability among the *researchers*, and not the data.

Accordingly, Churchill, Lowery, McNally and Rao (1998) remind us of the fact that the concept of reliability⁷⁵ is a human construct and thus bound to be re-defined and re-examined. When instead of measurement (as in quantitative approaches) we have verbal descriptions, reliability in the quantitative sense, i.e. both between the descriptions themselves and the researchers' analyses, is troublesome to conceive and define. Giorgi instead talks about the criterion of whether the reader can recognise what the researcher describes, when his/her method is followed, irrespectively of whether the reader agrees with the presentation or not.

We cannot talk about identical results here; as Wertz (1986) put it:

"[...] while in the realm of measurement to moreover that of facts, variation is an index of 'bad' error or inconsistency, in the realm of meaning, factual variation is the very 'good' means of achieving stability and consistency." (p. 197).

Other broadly discussed concepts are objectivity and subjectivity.

⁷⁵ –as actually all other evaluative criteria-

In general, the discussion implies the issue of reality; is there an objective reality? The phenomenological view (Spinelli, 1989) supports that when discussing 'objective reality', the meaning systems employed while experiencing something should be included. Reality is actually the process of interpreting things according to cultural guidelines and influences. The 'correct' interpretation depends on our socio-cultural backgrounds; we live a phenomenal reality.⁷⁶

Closely related to that is the issue of subjectivity, i.e. the difference between how things are presented and how they really are. Phenomenology cannot present the true nature of reality; the raw matter of the world is out of reach. The objects of perception are never experienced the same way twice; every time an additional or even different meaning is given to them⁷⁷. Phenomenology aims to grasp the interaction between this raw matter and our mental functions, i.e. the experience. We cannot have access to this physical reality, we know an approximation of it.

Furthermore, Spinelli (1989) discusses the concept of what is 'real'. He underlines that people call as real those objects that are located outside the sphere of the self, that which exists irrespectively of people, in the past, present, future. This is the theory of the objective reality. Phenomenology challenges this assumption and claims instead;

"[...] that which is experienced by us as being reality, is inextricably linked to our mental processes in general, and, in particular, to our in-built, innate capacity to construct meaning." (p. 2).

Thus the experienced world is a *phenomenal* world.

Consequently, nothing can be achieved without subjectivity and what matters is the *way* the subject is present.

"Objectivity itself is an achievement of subjectivity" (Giorgi, 1994, p. 205).

The interest of phenomenology is:

"[...] to understand the 'objective' in terms of subjectivity rather than trying to understand the subjective as opposed to the objective" (Giorgi, 1983, p. 135).

What is experienced depends on the experiencing act (Karlsson, 1993). Hence, every object has infinite possible noemata. Objectivity takes different meanings according to the

⁷⁶ Phenomenology thus avoids the use of such terms when discussing various reality interpretations. We are influenced by our socio-cultural environments, and no matter whether our interpretation is supported by the majority, it is always an interpretation (for a further elaboration see Spinelli, 1989).

⁷⁷ If we go back to what Husserl said, (Giorgi, 1995) the act of consciousness is directed to an object (referent), and this object is apprehended by the act (meaning). So we could have a lot of meanings for the same referent.

context⁷⁸.

"The transcendent objects making up the life-worlds are considered objective within each cultural life-world [...] all these cultural worlds are relative and subjective in relation to the invariant structure of the life-world [...]" (p. 72).

In other words, the natural attitude of the subjects implies that knowledge is valid in so far as it is true of objects conceived as so. *Intersubjectivity* gives the objectiveness and true existence to an object.

This leads us to *generalisation*. Results are expected to be generalised, i.e. to pertain to more cases than the ones investigated.

Giorgi holds the position that generalisability belongs to science as such, it is one of its central aims. In his method, generalisation is seen within the two levels of structure:

The 1 st level refers to the <i>concrete</i> description	The 2 nd level is the structure of the various structures of the individual experiences
---	--

As discussed previously, generalisation is possible, but is always context-dependent. Humans are historical socio-cultural beings, and the meaning they give to their experiences cannot help being influenced by those parameters⁷⁹.

Summing up, the value of the method can be delineated as such (Giorgi, 1983; 1989c):

- it deals with the human phenomena in a more complete way as it is more faithful to their nature (i.e. acknowledges the relation between subject-object).
- it highlights and acknowledges the role of the researcher in the research procedure (which is in any case constituted by him/her)
- it treats experience as a phenomenon in itself, worth to be studied⁸⁰
- it regards and treats the human subjects in their wholeness by respecting the fact that they are social beings, characterised by subjectivity, historicity and meaning-giving. Those

⁷⁸ Humans bestow meaning to the different situations; for example the object 'I' takes different meaning in different contexts: I at school, home/party/alone etc. I however, am the same person, I keep my identity through variations.

⁷⁹ "[...] essential findings do not have to be universal. They merely have to be eidetic." (Giorgi, 1997, p. 256). We should also not ignore the fact that the various variables, e.g. social context, cultural influences etc. are acknowledged as being present during research from both traditions, but are treated differently; the traditional research tries to control them.

⁸⁰ This in contrast to for example neuropsychology, where experience is an epiphenomenon: we study the brain in order to understand experience.

qualities are a target of control within the traditional quantitative model, whereas in phenomenology they are included -in the way they are understood by the subject.

- it overcomes the problem posed with traditional research, i.e. the incompatibility between the criteria followed and the nature of the human phenomena.

2.2.7. Phenomenological research on thinking and learning

Finally, I would like to refer to some selective phenomenological research literature on thinking and learning. Such a presentation reinforces the value gained when employing phenomenology in the present project.

Generally, phenomenology views humans as existing in the world, thus implying that mental experiences like thinking declare a relationship between man and the world; the meaning of those experiences needs to be clarified. Phenomenological description is directed toward such acts, among which the act of thinking (Buytendijk, 1987).

Karlsson (1993) suggests that when the aim is to investigate thinking, the phenomenological reduction is translated into bracketing the extant theories which explain thinking by reference to brain activity. The reflection, for example, on thinking while solving a mathematical task will not reveal any neurological factors.

"A phenomenological analysis of what thinking is would have to be done on the basis of the experience of thinking itself." (p. 17).

Hence, phenomenological research on such issues includes the following studies:

- Aanstoos (1986) carried out a phenomenological study on thinking. He criticises the traditional approaches to thinking by emphasising the lack of data on the actual process of thinking located in one of the dominant approaches, namely the information processing approach. The problem with the latter is that it simulates thinking before understanding what thinking is.

Aanstoos's study included five highly skilled players of chess. They were asked to think aloud while participating in a game of chess; they were tape-recorded and then interviewed. Aanstoos came up with results that conflict with findings from the information processing approach. He concludes that the differences uncovered indicate a shift in the way psychology views thinking; it should abandon the pre-determined models and

"[...] begin with the recognition of thinking as a genuinely explicitative process of bringing to clarity an ambiguous, referential network of possibilities." (p. 113).

- Cooper & McIntyre (1993) conducted an empirical phenomenological study of the relation between teachers' and pupils' perceptions on what is effective learning (in English and history lessons). Specifically, eight English teachers and five history teachers were observed in class. Observations were followed by interviews on the participants' experiences, specifically focusing on what functioned effectively.

The authors underline the importance of investigating the participants' perspective:

"It becomes the social scientist's function to understand the world of the classroom through the eyes of the teacher" (p. 381).

In detail, the significance of discovering the teachers' perspective is based on that the teachers' thinking influences classroom practice, and their pedagogical knowledge about effective learning. Likewise, the pupils' perspective is essential, as their understanding is related to their achievement, sense of control, use of strategies and evaluation.

- Finally, Giorgi has been carrying out phenomenological research on learning for the last decades (see Giorgi, 1989c; Giorgi, 1999a). He obtains descriptions of subjects' experiences of learning something; he does not define the learning situation beforehand⁸¹.

In presenting the basic results of this extensive research, he elaborates:

"One might say that learning, experientially speaking, is a temporally elongated insight and, behaviorally, that it is a temporally elongated process leading to competence [...] The ultimate goal of learning is to be able to understand various phenomena of the world so that one can move about in the complex world in a competent way. One chief factor that separates learning from insight or basic intelligence is temporality. Learning always seems to imply a lack of spontaneous understanding or achievement [...] the chief opacities are due to time and body and the overcoming of these existential factors require the phenomenon we call 'learning'." (1999a, pp. 81-82).

And he continues:

"[...] the person has to get a new perspective or perhaps new information has to be acquired from some other source or an expert other [...] risk is critical for learning and so encouraging risk-taking can be quite beneficial." (1999a, pp. 84-85).

Giorgi indicates with his research the importance in examining the learner's perspective; in order to reveal different ways of experiencing the phenomenon, we have to examine the individuals' way of living them.

⁸¹ He has conducted similar research on memory.

2.2.8. Critique of A. Giorgi's method

After having displayed the value of the phenomenological psychological method, critique and comments on the method, exercised by other researchers in the field are discussed.

Perhaps the most obvious aporia is what is really the difference between description and interpretation and why should the researcher prefer the first over the latter.

Drawing from phenomenological philosophy, we see that description is the understanding of the meaning of a phenomenon *exactly as it is presented*. Interpretation, however, is the clarification of a phenomenon based on a *possible theoretical perspective*. Giorgi (1992) explains that interpretation takes place when we ascribe meaning to the phenomenon, meaning which is though possible, liable. In other words, there is always the possibility, an openness to other accounts⁸².

Accordingly, the following objections posed by the adherents of interpretation, are answered in the following way, which simultaneously demonstrates the value of description (Giorgi, 1992):

a) *The meanings bestowed by the subject are not unique/univocal, but polysemic; interpretation is thus necessary* → description is faithful to the evidence, to the way it is presented. That implies that meaning sometimes *is* unclear and ambiguous.

b) *Interpretation is needed to go beyond the data. Mere description is not enough* → description is faithful to how the data presents itself; why should the data be perfect, with no gaps, and consistent? We describe the ambiguity.

c) *Interpretation is necessary due to the unconscious* → the situation where unconscious is employed, can be described; that is the point of interest.

d) *Humans are self-interpretive* → we describe these self-interpretations

e) *All meanings are interpretations* → that means that situations can be constructed again by humans, other possibilities exist for the various situations: we can describe the *range* of meanings for a situation. Besides, if that statement (e) is also an interpretation, the validity of the argument is not strong; if it is a description, the statement contradicts itself.

f) *No perfect descriptions can be obtained* → this is not necessary, we just need adequate ones

⁸² Let me note here that Giorgi does not reject interpretation. Both methods are useful, but under different circumstances. Interpretation could for example be applied

To sum up this point, anyone who follows the researcher's description should be able to see what the researcher sees. When one interprets, there is always another possible interpretation. Description *presents* the objects, it makes them accessible to others. Interpretation gives an *account of* the object.

Likewise, behaviourists maintain that phenomenology does not have a lot to offer to psychology. The actual aim of psychological research should be to control and predict human behaviour by providing generalisable rules; hence, subjective data is not acceptable, the validity and reliability of the method is doubted.

However, the very objectives of psychology should be re-examined; psychology should aim at the *understanding* of the human being and the human experience. Prediction and control is not compatible with the human nature, which involves will, motivation, personal and cultural influences. Besides, the interest of phenomenology is not in subjectivity itself, but in the *intentional relations*, in how we experience and interpret reality and act upon it. Phenomenology arrives to the essence of the experience, its invariant constituents that are shared by humans⁸³.

Others have accused phenomenology of a return to introspectionism. What is common between those two, is the engagement with consciousness. However, introspective research studies subjective experiences in order to reduce them to mental elements (e.g. feelings). Phenomenology focuses on the *meaning* of the stimuli for the experiencer and not the impressions of the stimuli (Spinelli, 1989). It is concerned about describing meaning, whereas introspectionists are concerned about providing the facts of consciousness.⁸⁴

Advancing to more specific issues, von Eckartsberg (1998b) points out that the phenomenological psychological method does not show clearly how the analysis is done when having to deal with more than one descriptions, thus when moving from the situated to the general structure. A similar difficulty is faced when applying the imaginative variation; Giorgi has not actually operationalised the procedure of moving from the meaning units to the transformation units, or from the transformation units to the structure.

I have to agree with the above; there do not exist clear instructions on how to perform those procedures. The researcher has to study previous analyses of the same kind, and practise with similar ones, before actually grasping the way to proceed. This is the only way to 'train'

⁸³ A similar point of critique is that on objectivity; the method is not scientific as no objective tests are used. However, complete objectivity is not achievable, as it has been already explained when discussing the scientific value of the method. See Spinelli, 1989 for more on the issue.

⁸⁴ For a more detailed presentation of the differences between phenomenology and introspection, see Giorgi, 1983.

someone in applying the method. However, as vague and demanding as that may sound, we must recognise that it is at the same time an advantage of the method. A strict operationalisation would turn the method into a mechanistic procedure, where, if specific actions followed, the results would be achieved. Research, however, cannot be reduced to a 'recipe'.

On the contrary, the way the method is now, it gives the freedom to the researcher to *discover* as s/he moves on. The particular perspective and attitude of the researcher are factors that determine how the analysis will develop. Setting strict limits to such a living procedure, would deprive it of its dynamic character or even its meaning. The strenuousness of the method should not equal its rejection.

It should be also emphasised here, that the phenomenological way of thinking is difficult to communicate; this is mainly because the early works of Husserl developed over a period of many years, and thus the various interpretations that exist are not all faithful to his thought (Giorgi, 1985c). An additional problem arises when the relation between phenomenology and psychology is examined; the meaning of psychology as a science is not unanimously defined. The dominance of the traditional paradigm creates a problem into calling the examination of the subjective experience rigorous 'science'.

Accordingly, other relevant questions arise, such as (Giorgi, 1985c): what are the criteria for a good description; what are the limits of a description; how can we check that the researcher has operated within the phenomenological reduction; how can the discovered meanings be useful for praxis etc. These matters have to be dealt with relation to and within the psychological perspective. This is why the transformation from the philosophical method to the psychological one is necessary.

As Cloonan (1995) concludes, the significance in phenomenology is its approach, the life-world, i.e. the concern and complete discussion around the existence of psychology, its characteristics and purpose. The method has a solid framework. Even though radical, it is nevertheless clear and solid, a fertile alternative to the natural science framework.

2.2.9. Why Giorgi's method?

I would like to close this section by briefly providing some more particular reasons for choosing A. Giorgi's method over the other qualitative and/or phenomenological methods, so as to avoid potential confusion on the issue.

- A combination of quantitative and qualitative methods is excluded. As stated in the beginning, there should always be theoretical and methodological agreement. The

combination of quantitative with qualitative approaches ('mixed discourse') is in that sense incorrect, as the two approaches adhere to different philosophies of science⁸⁵.

- Certain qualitative methods are presented as pertaining to an alternative paradigm, however are still under strong influence of the positivistic paradigm. Not all have managed to distance themselves, and are thus only partially qualitative. As analysed above, what guides the research method to be chosen is the phenomenon under investigation; we should not follow criteria of science that are not consistent with the phenomenon. Measurement, for instance, is used to achieve a certain goal, which however, can be achieved also by employment of other means, i.e. different kind of data. We should always take into account whether the research question asked is quantitative or qualitative; this guides also the kind of method applied.

- Qualitative methods that employ coding are rejected. Gough and Scott (2000) pose some questions around coding techniques -e.g. which one precedes, coding or data, the relationship between coding and analysis etc.- that I find myself in agreement with. It seems that in the case of coding, the researcher comes to the research situation with already-made conceptions, something that is considered counterproductive. The coding categories pre-determined are external to the actual research setting⁸⁶.

In conclusion, Giorgi elaborates his approach in a comprehensive way, compared to the other aforementioned researchers⁸⁷.

2.3. A CLOSE EXAMINATION OF THE METHOD AS APPLIED

A closer examination of the method as applied in the present study will now be presented.

Namely, the phenomenon investigated encompasses some peculiarities that led to a slight modification of A. Giorgi's method.

Specifically, 'critical thinking' is a concept difficult to understand and describe by the subjects. When I conducted the pilot study and asked for a specific experience of critical thinking within the classroom, I found out that the subjects were unable to identify themselves with it and thus provide a concrete description; this concerned especially the students. Even

⁸⁵ For a more complete explanation of certain 'mixed discourse' methods, see Giorgi, 1994.

⁸⁶ Taking grounded theory, for example: there is not an agreement on what exactly it is; the coding categories emerge from the data. The problem is to come with generalisable knowledge.

⁸⁷ See also evaluation by Cloonan, 1995; Karlsson, 1993.

though the concept 'critical thinking' is included in the school information the students have access to, they still could not give specific information about it. A different approach had to be adopted⁸⁸.

Consequently, the interviews conducted included questions that eluded both a direct explanation of the concept and a concrete example of critical thinking as applied at school. That way was proven fruitful to arrive at the core of the phenomenon.

It is due to this slight alteration of the type of data collected that I do not call the results achieved 'structures'. As the results do not namely emerge only from the analysis of concrete experiences of the phenomenon, it would be mistaken to claim that the findings are 'structures' in the strict phenomenological sense.

Instead, I label the results as '*gestalt of meanings*'. This in order to convey that they comprise of both specific descriptions and direct utterances on the phenomenon. The term 'gestalt' is used to express the fact that the data analysis took under consideration the experiences as a whole; the parts make sense only in relation to the whole, and vice versa. The term 'meanings' is used in order to convey that the analysis indeed aimed at uncovering the genesis of the 'naive attitude', at discovering the meanings the participants bestow to their experiences.

I operated during the whole analysis under the phenomenological reduction, I used the free imaginative variation, and arrived to the essence of the phenomenon. I therefore consider myself to have acted within the phenomenological psychological method, without violating its premises, but by adapting the method to the nature of the phenomenon investigated. Even though 'critical thinking' belongs to the ideatic objects of consciousness, like other phenomena investigated with the same method⁸⁹, its demanding character called for a modification in the way it was investigated.

Finally, a specific example of the analysis is given, in order to demonstrate how the theory presented above is applied into praxis⁹⁰.

The following excerpt is from the Principal of School 1. The first column includes the raw data, the second the meaning units, and the remaining columns the transformation units. The numbers given are counting the meaning units, for practical purposes. Note that the transformation units might be further elaborated during the analysis; two or more units might

⁸⁸ More details are given in the section '*Design*'.

⁸⁹ E.g. learning, first love, bravery etc.

⁹⁰ The full analysis of the data can be found in *Appendix*.

skjønner hvorfor.	kr, så bør man jo egentlig skjønne at det er feil da. Da bør man i alle fall skrive under at svaret må være feil, som enkelte elever gjør noen ganger. Uten at de nødvendig skjønner hvorfor.	above wrong way, should have realised that the answer they provided was mistaken, as it would not be possible to be encountered in an analogous situation in everyday life. S specifies this recognition does not need to be followed by an apprehension of what is actually wrong in the way the problem was solved.	control the presence of inconsistencies. Simultaneous comprehension of the reasons behind a mistaken solution does not necessarily take place.
-------------------	---	---	--

a) Meaning units: The excerpt is delineated into three meaning units (38-40). Meaning unit 38 is an introduction to the example that follows; the subject states what the example regards. Unit 39 is the presentation of the specific problem the students are given, and how some of them solve it wrongly. Unit 40 is an explanation of why and how the students should have realised the mistake they made.

b) Transformation units: Some of the most central parts are discussed.

Unit 38 is simply what the situation is about, hence "the subject situates the experience".

Unit 39: "*a rather simple mathematical calculation*". Here the essential is not to specify that it is the 9th class that solves the problem, but rather the relation the class has to the specific problem, i.e. its level of difficulty. Thus, the use of the word 'simple' is done based on the fact that the problem is given to the 9th class, a level where the students should be quite familiar with such calculations.

"the facts given had a 'real' character". The important thing here is not to mention the exact object used in the problem, i.e. a rubber. The significance of it is that it is an object existing in everyday life, and that the students are familiar with its 'real' value.

"the exact relation between the numbers given had to be found by the students themselves". This attempts to describe the fact that the students had to put the numbers given in the correct order, so as to execute the specific mathematical act. This order expresses a relation between the numbers.

"based on the most apparent association with regard to the external features of the numbers". This expresses the fact that the students choose to divide 100 by 50, as this seems to be a natural thing to do; 100 is larger than 50, and comes first in the problem instructions. In other words, the students examine not the essence of the relation between the numbers, but only their external features, i.e. which one is bigger/comes first.

Unit 40: "*examine closely how to relate the numbers*". The subject clearly says:

"når man gjør slike enkle stykker så må man være kritisk til hvordan man setter opp tallene"

'Examine closely' is used instead of 'critical', so as to avoid to use the concept that we are actually examining.

"should have realised that the answer they provided was mistaken, as it would not be possible to be encountered in an analogous situation in everyday life". The subject says that

"og hvis man svarer at et viskelær koster 5000 kr, så bør man jo egentlig skjønne at det er feil da"

In other words, the student should know that a rubber in reality cannot possibly cost 5000 kroner, this is an unrealistic number. So, by looking at the number found –5000- the student should automatically use his/her experience from everyday life, connect it to real life and realise it must be wrong.

"this recognition does not need to be followed by an apprehension of what is actually wrong in the way the problem was solved". The subject says that even indicating that the answer is wrong is enough to show that the student has reflected on the result achieved, even if no indication of why it is wrong is included:

"Da bør man i alle fall skrive under at svaret må være feil, som enkelte elever gjør noen ganger. Uten at de nødvendig skjønner hvorfor"

As mentioned above, the initial transformation units might be altered due to further elaboration. This is also the case here, where the first two units have been re-written into one, and the third unit has also been re-formulated.

Units 38-39: Here the most essential meaning of the subject's data has been kept. Free imaginative variation lead to the substitution of the previous 'mathematical calculation' with 'problem'; instead of a calculation the students could have had another type of question to answer, that however required the same kind of reflection and examination. The significant here is that the students are faced with a problem of certain characteristics, which are also given: *"features pertaining to a real situation, and asks for a discovery of the way to relate the elements given"*. No specific reference to 'numbers' is done here, as the word 'elements' expresses the meaning of numbers or facts.

"this requires moving beyond the most obvious": This expresses the previous description *"some of the students related the numbers based on the most apparent association with regard to the external features of the numbers"*. The specific references to the numbers and the focus on external features is not included, as what is the essential here is that the answer of how to relate the elements is not the most obvious one, it requires some deeper examination of the whole.

Unit 40: This unit conveys the essential of the initial transformation unit 40, meaning the importance of using one's everyday knowledge as a criterion for the correctness of the answer provided.

As the above excerpt is only a part of the whole data, the process that leads to the structure of the phenomenon is not possible to be given here. Nevertheless, the rationale behind it is similar to the creation of the transformation units, where free imaginative variation brings forth the essential.

Finally, let me emphasise once more, that if the reader of the present illustration were to analyse the same data, s/he would not necessarily have to come up with the same results; rather, the reader has to 'see' what the researcher sees, independently of whether s/he agrees or not.

2.4. PARTICIPANTS – DATA COLLECTION

The aim of the study is to unveil as many aspects of critical thinking as possible; hence, participants from both theoretical and vocational studying directions are of interest. Correspondingly, two schools from the same county district are chosen; these offer a different kind of education within upper secondary schooling, namely theoretical and vocational.

As the county district provides a number of such schools to choose from, the decisive factor determining the two particular schools selected, is availability. Many schools had been targets of study before and were thus not willing to participate in the present project.

It was further decided that the participants attend the advanced level I (hereafter VKI). The assertion underlying this choice is that some experience with the principles, objectives and working methods regarding upper secondary education is necessary; hence, the participants should have had completed the foundation courses. Besides, the advanced level II is excluded, as a) the higher level of specialisation would perhaps not allow experiences from a broad range of areas and b) the vocational training is carried out mostly at industries and not at school.

Specifically, the two schools are:

a) *School 1*, with studying directions that provide university entrance qualifications. The participants come from the following subjects: general theoretical ('Allmenne fag' - hereafter AA); industrial design ('Formgivingsfag' – hereafter FO) and drama subjects ('Drama' - hereafter DD).

b) **School 2**, which offers training only into mechanical subjects (hereafter ME), hence provides with a vocational certificate. The participants attend the subjects; vehicles ('kjøretøy') and car painting ('billakkererefeget'). Because of the common nature of these two studying directions, no differentiation is made with regard to the specific course each of the participants follows.

The detailed description of the participants is now given along with the presentation of the two phases of the research –the pilot study and the main study.

2.4.1 Pilot study

Permission to carry out the present study was first received from a) the Educational Office of the county the schools belong to (in spring 1999) and b) the Norwegian Social Science Data Services (NSD – in summer 1999).

I approached the schools' administration, explained the purpose of the study and received permission to conduct interviews. The administration, in turn, presented the project to the VKI classes and asked for volunteers; a short written description of the study was also given to them⁹¹. Both teachers and students were asked to participate; one teacher and two students from each studying direction from School 1, and from each of the three VKI classes from School 2, were randomly selected out of the volunteers. The particular number of participants was to be examined further; if satisfactory data was not acquired (i.e. being faithful to the phenomenon), then more persons would be interviewed.

The interviews were conducted in autumn 1999 and spring 2000.

Some departing questions/issues functioning as the axis of the interviews were planned beforehand. Otherwise, depending on the participant's answer, the rest of the questions emerged while being in the interview situation -always guided by the specific phenomenon investigated. The initial questions did not address critical thinking directly, but rather some school situations that would give information enlightening the phenomenon⁹². The rationale behind this choice was that critical thinking is a concept of a complex nature, and perhaps the participants could not be able to provide a specific description.

In addition, in order to discover the research technique that gave best results, some students were first asked to give a written description of the aforementioned situations, and were afterwards interviewed on them. Specifically, four of the students from School 2 were each asked to describe a specific experience⁹³.

⁹¹ See 'Appendix B', 'Various Enclosures 1'.

⁹² See 'Appendix B', 'Various Enclosures 2'.

⁹³ See 'Appendix B', 'Various Enclosures 3'.

The analysis of the pilot study took place in autumn 2000. The results provided insight to the planning of the main study. Specifically:

- the investigation of the phenomenon with the use of written descriptions did not prove to be more effective than the use of interviews.

- the interview questions used were problematic for some cases; not all questions evoked information and experiences directly referring to critical thinking application.

Subsequently, for the preparation of the main study, the following steps were taken:

- written descriptions were abandoned as a research technique; only interviews were conducted, as they were an adequate means for acquiring information from the participants.

- the nature of the questions was altered: a more direct approach to the phenomenon of critical thinking was adopted, with description of a specific experience included.

- the number of the participants remained initially the same. If it was proven on the way not to be adequate, then more subjects would be interviewed.

2.4.2. Main study

After the analysis of the pilot study, and as more insight into the phenomenon under investigation was acquired –via both literature readings and academic discussions- the scope of the study broadened. Beside the main goal of examining critical thinking as a phenomenon per se, other sub-goals emerged.

Specifically, the examination of critical thinking at other levels of the school realm is also included, i.e. the way it is conceived and experienced by persons acting at different stages within the educational system. In other words, the metamorphosis of the meaning and application of critical thinking from its initial intention as presented in the Core Curriculum to its expression within the classroom realm became a study objective.

The main study was carried out in spring 2001. It should be mentioned here that before the beginning of the interview, all the participants read two paragraphs concerning critical thinking included in the Core Curriculum⁹⁴. The purpose with that was to set a conceptual framework. In other words, after the difficulties the participants had in discussing the phenomenon during the pilot study, it was considered necessary to orient them directly on critical thinking as described in the core curriculum.

The description of the participants is now given; to ensure anonymity, all the information that could reveal the identity of the persons are removed; certain exceptions are indicated. Moreover, the *female gender* is used indifferent of the real gender of the

participants. The only exception is the case of the students, where the gender is kept for practical reasons, meaning in order to differentiate between them during the discussion of the results.

The participants are as follows:

A) The *Minister of Education* at the time the Core Curriculum was set into practice, namely Gudmund Hernes. As mentioned in the introduction, he was responsible for the conception and writing of the Core Curriculum. He was thus chosen as the most direct and reliable source to elucidate critical thinking in the school practice, as intended by the new curriculum. Admission to use his name in the study was acquired.

Some basic interview questions were planned from before; they regarded the meaning and intention of critical thinking as presented in the document, as well as critical thinking application in the classroom. In addition, as this interview was the last one conducted, the paradox that had emerged from the other interviews concerning the application of critical thinking with use of pre-determined criteria was also explored. The interview lasted ca. 45 minutes.

B) A person with a *pedagogical administrative position* at the Educational Office of the county the schools belong to (hereafter 'Pedagogical Leader'). The Educational Office is generally a link between KUF and the school arena. Its responsibilities include issues such as the realisation of the national goals and evaluation, the development toward a better quality of education. The Office should also ensure equal rights and treatment for all, comprising thus a place one can refer to when analogous problems occur. The Office is also obliged to deliver a yearly report to KUF, concerning school matters (KUF, 1999).

Thus, as one of the main assignments of this office is to ensure application of the goals presented in the Core Curriculum, I wished to capture the experience of the phenomenon from the perspective of a person working at this level of the educational arena. This, under the assertion that the way critical thinking is conceived at this level will eventually influence the school practice, as the school administrators and leaders are in contact with the Educational Office.

The Pedagogical Leader's responsibilities, in specific, regard schools with general theoretic and vocational studying directions -hence both the schools investigated here. Her duties include inspection of issues concerning the general functioning of the school, the application of the core curriculum, and more specific problems that the individual schools face (KUF, 1999).

⁹⁴ See 'Appendix B', 'Various Enclosures 4'

The interview with the Pedagogical Leader lasted ca. 20 minutes. The questions planned beforehand included her role in ensuring the application of critical thinking at schools, her conception of critical thinking, the way teachers can apply it in the classroom, and studying techniques.

C) The *school principal*. She is responsible for the general function of the school, and the application of the Core Curriculum goals, among others. Her role requires solid knowledge of the situation found in the classroom, and subsequently contact with all the parts involved in the everyday school reality. Consequently, an interview with the school principal provides insight into the main type of guidance and influence teachers and students receive, always regarding the particular phenomenon.

Thus, both principals from School 1 and 2 were interviewed. The pre-planned interview questions concerned their role in ensuring application of critical thinking, the way the teachers can apply it in the classroom, learning strategies. The interviews lasted ca. 45 minutes each.

D) Finally, teachers and students from both schools were interviewed. In accordance with the observations from the pilot study, the interview questions addressed the conception of the two Core Curriculum paragraphs, the experience and application of critical thinking in the classroom, learning strategies. The interviews lasted between 15-30 minutes each.

The specific distribution of the participants is presented in '*Appendix*', '*Various Enclosures 5*'. It should be noted that the number of students and teachers was proved adequate to uncover the phenomenon, and thus no additional subjects were addressed.

In addition, due to adverse recording conditions, one of the interviews with a student from School 2 was not audible, and was thus not taken into account.

Finally, the term 'critical thinking' is used in spite of the fact that the core curriculum alternates between 'critical thinking' and 'critical judgement'. This, as the two terms are considered to convey the same meaning in the document, thus being the same in their essence.

CHAPTER 3: RESULTS

This section contains the 'gestalt of meanings' conveyed with critical thinking and learning strategies as experienced by the participants.

For presentational purposes, the gestalt addressing critical thinking is divided into; 'perception of critical thinking' and 'application of critical thinking in the classroom'.

In addition, in the case of the Pedagogical Leader and the two principals, their 'role' in relation to critical thinking application within schools is given in a separate division. 'School culture' is an additional category presented under the experiences of the two principals. This contains the information on school structure, organisation, special features⁹⁵.

Experiences of learning strategies are also given where information is available; they are divided into 'students' techniques' and the 'teacher's role' (i.e. how the teacher contributes to their promotion).

The presentation of the experiences has the following order: G. Hernes, Pedagogical Leader, participants from School 1 (i.e. principal, teachers, students) and participants from School 2 (principal, teachers, students).

Finally, a table with an outline of the various constituents of those gestalt of meanings is given for each group of participants⁹⁶. Critical thinking tables are divided into 'perception' and 'application'. Learning strategies tables according to the two principals present the information under three main themes; the *time* when they are taught, their *content* and their *value* (i.e. their role and contribution to the students' learning). The corresponding experiences of the other participants are given under 'students' techniques' and 'teacher's role'.

3.1. G. HERNES

a. Perception of critical thinking

For S⁹⁷, critical thinking pertains to the process of creating an object/situation. It includes: a) the discovery and identification of the criteria used to evaluate this object/situation, which refer to the object/situation's central aspects; b) the mental elaboration of those criteria, addressing their origin and process of establishment. Both identification and mental elaboration involve consideration of the criteria's past form and comparison of similar

⁹⁵ The particular purpose of those divisions are given in the 'Discussion' chapter

⁹⁶ See 'Appendix B', 'Tables'

objects/situations, and c) the application of those criteria. The latter requires adequate knowledge of the already established system/s of evaluation.

For S, critical thinking leads to: a) the comprehension of the extant ideas, rules and norms; b) the creation of novel ideas, rules and norms, and c) the preservation of the traditions. The creation of novel ideas and rules is achieved by overcoming the extant ones; previous demonstration of a similar procedure is required.

For S, critical thinking requires: a) awareness of possible alternatives to the extant criteria/rules/norms; b) an interest in the object under investigation; c) an attitude of interest for the others, and d) familiarity with the object/situation.

For S, young age is a factor enabling the surmounting of the extant rules/norms.

The formulation of critical thinking contains a contradiction, in the sense that it includes both creation of novelties and use of standardised evaluative criteria, which is though potentially positive.

b. Application of critical thinking in the classroom

For S, critical thinking is applied: a) under the examination of everyday, familiar situations; b) under the execution of practical assignments and their presentation; c) under the introduction of theoretical issues with the use of a practical illustration, with situations pertaining to everyday life; d) when new knowledge is presented with the help of the extant one and e) when the students are asked to present novel solutions to old problems.

For S, the application of critical thinking depends *on the teacher*, i.e. his/her a) willingness and ability to stimulate the students' interest by identifying and using situations/issues familiar to the students; b) ability to continuously accommodate to the students' and the situation's characteristics; c) ability to make the students aware of the knowledge and skills they possess; d) ability to present the issues gradually, according to their perplexity degree and the students' capability and e) ability to illustrate thinking out of the extant frames.

For S, the application of critical thinking depends also *on the students*, i.e. their awareness of the abilities they possess regarding execution of complex mental elaboration.

⁹⁷ 'S' is an abbreviation of 'Subject'

3.2. THE PEDAGOGICAL LEADER

a. Perception of critical thinking

For S, critical thinking is when, by use of comparison and contrast, intellectual examination of the information acquired takes place.

b. Application of critical thinking in the classroom

For S, critical thinking is applied under the active participation of the students in the central aspects of the learning process and under project-work.

c. The Pedagogical Leader's role

S is in infrequent contact with the schools both in a direct and indirect way.

S is not responsible for controlling the application of detailed issues at schools, as for example critical thinking. She is rather in charge of examining the general function of the schools, namely selective issues included at the core of the Reform -94. The area of the issues covered is directed by practical reasons.

She advises the schools in the direction of the core curriculum guidelines.

Her knowledge and duty covers the schools providing with university entrance qualifications, and specifically the general theoretical studying direction (AA).

d. Learning strategies

The first-year-students participate in a rather short course on studying techniques of either a general character or connected to specific subject areas.

For S, the instruction given during the first year is necessary as it forms a basic working method; this instruction is adequate for the coming years.

S does not acquire specific information about the instruction of studying techniques at schools. It is assumed that schools take it up, since it is directed so in the core and specific curricula.

For S, studying techniques contribute to the active participation of the students in the learning process.

3.3. SCHOOL 1

3.3.1. Principal

a. Perception of critical thinking

For S, critical thinking: a) is when based on mental elaboration, personal judgements about the information received takes place. This process requires generation of new connections among the various knowledge areas, acquisition of additional informational sources, personal experience and coherent knowledge, and an attitude of interest and curiosity for one's surroundings; b) is when decisions are made regarding the working process and its improvement; c) contains an attitude of opposition to established societal norms.

Critical thinking is only applicable when one is presented with information related to issues that one has experience with from everyday life.

b. Application of critical thinking in the classroom

For S, critical thinking is applied: a) through group and project-work; b) through the participation of the students in the working process; and c) through the completion of school assignments of a practical character, which are related to everyday issues.

For S, the application of critical thinking depends on a) the nature of the school subject; b) the type of the exam goal, and c) the teacher's attitude.

The examination of the demonstration of critical thinking by the teachers is not possible.

c. The principal's role

S has a close co-operation with each one of the teachers in order to ensure that effective learning takes place. This is achieved through individual discussions around the working methods and process.

The principal is also teaching herself.

d. School culture

The principal ensures the application of the general curriculum takes place by a) the appointment of certain persons that are in close co-operation with the teachers, regarding their working methods and b) the creation of an especially designed programme. The teachers are given freedom to use their own potential and construct the lessons accordingly. Co-operation and exchange of ideas between the various subject areas takes place.

The principal ensures the students are taken care of by the appointment of especially trained persons that are in close contact with the students and discuss school and everyday issues with them. The student is seen as a person in his/her whole. Moreover, there is no difference in the teacher - student status; they share the learning responsibility.

The principal acknowledges that certain problems are faced when it comes to the application of the general curriculum in the general theoretical subjects (AA).

e. Learning strategies

According to S, the first-year-students participate in an obligatory course on studying techniques of a general character. These techniques are directed to the reading environment, memory enhancement and working conditions.

The second-year students receive a repetition of those techniques; it is up to the individual teacher to take them up in his/her class.

For S, studying techniques help students deal with school demands of a higher level.

3.3.2 Teacher FO

a. Perception of critical thinking

For S, critical thinking comprises of the theoretical explanation of the practical working process followed and of the evaluation of one's work; the latter is carried out with the use of pre-determined standard/criteria and the others' work.

For S, the development of critical thinking occurs gradually, and builds upon previous knowledge. It requires solid knowledge of the central aspects of the working tools.

b. Application of critical thinking in the classroom

For S, critical thinking is applied under three different types of work evaluation that constantly take place in the classroom: a) the students themselves make decisions concerning central aspects of the assignment, choosing out of the pre-determined goals given in the curricula; b) the assessment is based on given criteria determined by both the individual him/herself and the teacher and c) the assessment is carried out without any specific criteria in mind, with the class participating as a whole. All types of evaluation take place both individually and in groups.

For S, critical thinking is enabled by the physical proximity of the students in the classroom.

c. Learning strategies

Students' techniques

For S, hard and consistent work together with good knowledge of the working goals/criteria for the assessment of the work are conditions for a successful exam. In addition, the ability to communicate, namely to be able to present and explain the work procedure is necessary. Review of previous work and finding out alternatives for improvement are helpful.

Teacher's role

For S, the teacher's role comprises in explaining and analysing the working goals sufficiently in order for the students and the teacher to reach a common understanding of what the working expectations are. The teacher's helping role consists of talking to the students and figuring out the difficulties.

3.3.3. Teacher – DD

a. Perception of critical thinking

For S, critical thinking embraces the analysis of one's work and its evaluation; both objective and subjective standards are used.

It requires acquisition of experience.

b. Application of critical thinking in the classroom

For S, critical thinking is applied constantly, firstly due to the nature of the subject. Secondly, it is applied through: a) the writing of work journals and b) the observation and participation in work production and execution.

c. Learning strategies

Students' techniques

For S, pondering over one's work constantly, studying the other's work and trying it out are conditions for a successful exam. A good preparation technique is repeated practice with similar exam assignments. Knowledge of the assessment criteria and of how to co-operate successfully with others is necessary.

Teacher's role

For S, the teacher's role comprises in observing the students' group-work and giving them advice on how to resolve issues in co-operation.

3.3.4. Teacher – AA

a. Perception of critical thinking

For S, critical thinking is when one uses experience, pondering and contemplation, in order to demonstrate autonomous reasoning and make conjectures.

It depends on biological factors.

b. Application of critical thinking in the classroom

For S, critical thinking is applied through the execution of debate.

The application depends on the nature of the school subject.

c. Learning strategies

Students' techniques

For S, acquiring pre-made arguments from various sources and through group-work, as well as practising in all the writing styles the school subject includes, are conditions for a successful exam.

Teacher's role

For S, the teacher's role comprises in assisting the students when facing problems in finding arguments while working in groups. Limitations of a biological nature determine the amount of effective assistance.

3.3.5. Student – FO (Female)

a. Perception of critical thinking

For S, critical thinking embraces the evaluation of one's own work.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students are working on their own with: a) evaluating both their work and the others' and b) making decisions on the ways to carry out and improve their work.

c. Learning strategies

Students' techniques

For S, reading through the learning material, keeping notes and writing keywords of the important parts guided by the given learning goal, are studying techniques that contribute to a successful learning. S has heard about studying techniques only once.

For S, these studying techniques are demanding and thus S feels she could use them only sporadically.

Teacher's role

For S, when the teacher is asked for help with studying techniques, s/he points out what to read, but at the same time regards the teaching of studying techniques unnecessary.

3.3.6. Student – FO (Male)

a. Perception of critical thinking

For S, critical thinking is when with the use of extant knowledge and the rules governing the nature of the object under scrutiny, examination of what is learnt takes place. It also includes awareness of the central aspects of the working process.

b. Application of critical thinking in the classroom

For S, the students are given only a small opportunity to demonstrate critical thinking in the classroom, under the presentation of their work for the rest of the class.

c. Learning strategies

Students' techniques

For S, planning his studying in accordance with the teachers' expectations and the learning goal contributes to a successful exam result.

Teacher's role

For S, when the teacher is asked for help with effective studying, s/he provides little, mainly further clarification of the subject.

3.3.7. Student – DD (Female)

a. Perception of critical thinking

For S, critical thinking embraces the examination of the information received and the evaluation of the working product.

It enables one to give criticism, which involves evaluating one's work within one's

working group and receiving evaluation by others.

It can have both positive and negative character.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students are free to express their opinion and suggest alternatives for the work.

The students did not receive any particular training for that.

c. Learning strategies

Students' techniques

For S, estimating first the time needed to read through the material, going through it once, and keeping notes of a) important parts in relation to the theme and b) areas where she lacks knowledge, are studying techniques that contribute to a successful learning.

She has heard about studying techniques only once, i.e. to isolate the central theme, skim through the text and gradually go into it in detail. She makes use of them sporadically.

Teacher's role

For S, when the teacher is asked for help with the studying techniques, s/he repeats what the students have been taught before. The students are not particularly encouraged to apply these techniques.

3.3.8. Student – DD (Female)

a. Perception of critical thinking

For S, critical thinking embraces the intellectual examination of the information received so as to form an opinion before accepting it; this requires a favourable milieu. It also includes intellectual examination of the central aspects of the working process, with the aim of improvement. Training in this type of evaluation carries a potential adverse effect.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students are expected to constantly evaluate their work throughout the year.

They have been trained in this process by observing the teachers pointing out where and how working improvements can be made.

c. Learning strategies

Students' techniques

For S, a) acquiring a broader perspective on the learning material from other sources than the textbooks and forming a corresponding meaning and b) working consistently with high levels of concentration, are studying techniques that contribute to a successful learning.

She did not have any particular training on studying techniques, but she learnt from her earlier schooling experience which studying method gives best results.

For S, studying techniques are not quite necessary in her subject, due to the practical nature of the work.

Teacher's role

For S, the teacher does not provide any help with studying techniques, due to the practical nature of the subject.

3.3.9. Student – AA (Female)

a. Perception of critical thinking

For S, critical thinking is when faced with information, blind acceptance does not occur, but by use of previous coherent knowledge, additional information sources and being facilitated by a favourable milieu, intellectual examination of the information given is carried out.

b. Application of critical thinking in the classroom

For S, critical thinking is applied: a) as the students identify the causes and consequences of given facts, by making connections among the learning material; b) under group-discussion and c) as the student participate actively in the main aspects of the learning process.

It depends on: a) the nature of the school subject; b) the teacher's attitude and c) the exam type.

c. Learning strategies

Students' techniques

For S, giving emphasis to the points the teacher views as important while one studies - by for instance underlying the main points- is a requirement for a successful studying.

Teacher's role

For S, the teachers do not advise the students on how to study successfully, as their main goal is to manage to go through the textbook/s within the given time. Individual help is possible, though -when asked from the student- with for example how to draw out the main points.

3.3.10. Student – AA (Female)

a. Perception of critical thinking

For S, critical thinking embraces the examination of information before accepting it and in the evaluation of the instruction.

Critical thinking requires; personal effort, knowledge on and interest in the subject, an inquiring attitude and a favourable milieu.

In some cases, it may involve risk taking and create a negative atmosphere.

b. Application of critical thinking in the classroom

For S, critical thinking is applied: a) by keeping a working journal and b) under group-discussion.

The application depends on a) the nature of the subject and b) on the teacher's attitude.

c. Learning strategies

Students' techniques

For S, reading through the whole of the learning material, giving emphasis to the important parts and acquiring other relevant information are studying techniques that contribute to a successful learning.

S has heard about specific techniques only once, and makes use of them only when: a) he considers the exams important and b) he wants to perform well.

Teacher's role

For S, when the teacher is asked for help with studying techniques, s/he gives advice to a) read the material a lot of times and b) keep notes.

3.4. SCHOOL 2

3.4.1. Principal

a. Perception of critical thinking

For S, critical thinking comprises of: a) the examination and evaluation of the information given, with the help of personal knowledge stemming from everyday experience; b) the discovery of solutions for a working problem, with the help of both solid theoretical knowledge of the subject and knowledge of the working object, as well as elaboration of indicative factors; c) the examination of working issues; and d) the assessment of the way the instruction is carried out.

It requires a degree of activity from the students' side.

b. Application of critical thinking in the classroom

For S, critical thinking is applied under the solution of the practical working assignments, as the nature of the working object calls for integrated assessment of indicative factors that are situation-laden.

The application depends on: a) the students' level of training; b) the students' degree of engagement in the learning process; b) the exam goals; and d) the presence/absence of learning difficulties.

It requires a favourable milieu.

c. The principal's role

S does not have a close contact with the students, as she does not teach herself. She rather has co-operation with the staff, with who she has discussions on the working methods and learning process. In that way, she can control the application of the core curriculum.

d. School culture

S maintains that the core curriculum includes *description* of the instruction's content and not *goals*. It also includes qualifications the students should possess.

The school appoints certain persons that are in close co-operation with the teachers regarding their working methods. Not all the teachers all trained pedagogues.

The students have the opportunity to participate in the designing of the instructional method. They are also expected to ponder over work assignments and evaluate their training. S indicates that critical thinking is not a priority area for the training. Due to educational rules

after the Reform 94, the school gives priority to students with low previous school performance and/or learning difficulties. The majority of the students suffer from them. The students are not enthusiastic/willing to attend school; the main goal is to increase the students' motivation. Practical work is prioritised; theory is limited to the absolute necessary.

e. Learning strategies

According to S, the first-year-students receive some short training in studying techniques which aim to teach the students how to extract meaning from a work-related text.

The studying techniques are designed in relation to the demands the students will face in the future working life.

For the rest of the classes, it is up to the individual teacher to include studying techniques in the instruction.

3.4.2. Teacher 1

a. Perception of critical thinking

For S, critical thinking is when based on experience and practice, achievement of a common understanding regarding a working problem, and discovery of various working ways that lead to the same result, occur. In addition, critical thinking is the act of evaluating the teaching and learning method used. It also includes an attitude of scepticism toward the learning material.

b. Application of critical thinking in the classroom

For S, critical thinking is applied: a) by acquiring experience and b) by assessing the learning process and methods.

The students have received analogous training in their previous schooling.

It is enabled by the learning techniques used by the teachers.

c. Learning strategies

Students' techniques

For S, acquiring experience through individual and group-work, together with observing efficient student-models are conditions for a successful exam.

Teacher's role

For S, the teacher's role comprises in assisting the students with adjustment at a more individual level when facing problems with critical thinking and learning.

3.4.3. Teacher 2

a. Perception of critical thinking

For S, critical thinking is when, based on experience and elaboration of external criteria, the correct mode of action is discovered.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students assess the given situation on their own with the aim to find a proper solution.

It is hindered by the presence of learning difficulties, and facilitated by special teaching techniques.

c. Learning strategies

Students' techniques

For S, the understanding of the connection between theory-practice, trying various solutions, learning by making mistakes and repeating the learning material, are conditions for a successful exam.

Teacher's role

For S, the teacher provides help at: a) an individual level by clarifying the material and by teaching the students how to think independently and b) by presenting the learning material from various angles.

3.4.4. Teacher 3

a. Perception of critical thinking

For S, critical thinking is when based on theoretical knowledge, experience and apprehension of the extant factors, one is able to evaluate the working situation and choose a correct mode of acting, independent of the novelty of the situation.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students carry out working assignments on their own.

c. Learning strategies

Students' techniques

For S, a successful exam is achieved when the students: a) elaborate a previous exam paper and b) evaluate themselves on their performance and point out the points where they need more work.

Teacher's role

For S, the teacher provides help by showing the students how to proceed when facing difficulties with the execution of a practical job. This help is limited, due to: a) time restrictions and b) the class structure.

3.4.5. Student 1 (Male)

a. Perception of critical thinking

For S, critical thinking is a) when driven by personal interest, one appraises professional issues; b) when self-evaluation of one's performance takes place. The latter contributes to personal insight.

b. Application of critical thinking in the classroom

For S, the students are not particularly encouraged to demonstrate critical thinking. The application depends on the teacher's attitude.

c. Learning strategies

Students' techniques

For S, going through the learning material slowly and many times with the aim to uncover its meaning, are studying techniques that contribute to a successful learning.

Teacher's role

For S, the teacher advises the students to go through the learning material slowly and many times, attempting to find its meaning, in order to have a successful learning.

In addition, the teacher does not provide answers directly when asked, but poses guiding questions to the students that contribute to their finding the answer on their own.

3.4.6. Student 2 (Male)

a. Perception of critical thinking

For S, critical thinking includes examining the negative consequences of work-related issues.

b. Application of critical thinking in the classroom

This is not relevant to S, as his perception of critical thinking does not involve classroom activity.

c. Learning strategies

Students' techniques

For S, reading through the textbook and paying particular attention to selective parts (i.e. own notes, teacher's suggestions and areas he lacks knowledge on), contribute to a successful learning.

Teacher's role

For S, when the teacher is asked to provide help with studying techniques, she gives the subject area the exam is going to be on, and points out the most essential parts in the textbook.

3.4.7. Student 3 (Male)

a. Perception of critical thinking

For S, critical thinking includes discovering one one's own a solution to the working problem.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students are left on their own to try and find ways to solve the working problems.

c. Learning strategies

Students' techniques

For S, acquiring first a comprehension of the exam question, and then trying out in practice theoretical considerations are effective ways to achieve a good exam result.

Regarding theory, for S keeping notes and recording the lectures contribute to a successful learning.

Teacher's role

For S, when the teacher is asked to provide help with studying techniques, she gives solutions to extant and potential problems.

3.4.8. Student 4 (Male)

a. Perception of critical thinking

For S, critical thinking is an unknown term.

b. Application of critical thinking in the classroom

For S, critical thinking is an unknown term.

c. Learning strategies

Students' techniques

For S, studying techniques is an area he had training in during his previous schooling. Keeping notes of the essential information contributes to successful learning.

Teacher's role

For S, when the teacher is asked to provide help with studying techniques, she does not give any specific advice on that, as he rather concentrates his help in informing the pupils about how to carry out the task in practice.

3.4.9. Student 5 (Male)

a. Perception of critical thinking

For S, critical thinking includes considering the negative consequences of work-related issues.

b. Application of critical thinking in the classroom

For S, critical thinking is applied as the students take action regarding the work-hazardous situations.

c. Learning strategies

Students' techniques

For S, studying in an environment free of disturbances and keeping notes contribute to an effective learning.

Teacher's role

For S, when the teacher is asked to provide help with studying techniques, she advises the pupils to study in an environment free of disturbances and gives further explanation of points where difficulties arise.

CHAPTER 4: DISCUSSION

The discussion consists of two main parts. The first part contains the elaboration of the results, a detailed analysis of the gestalts of meanings conveyed by the participants' experiences. The second part includes a dialogue with the current literature, meaning a comparison of the findings with the literature presented in Chapter 1.

4.1. ELABORATION OF THE RESULTS

Due to the richness of the results, and in order to elucidate the meaning of the differences found, the findings are discussed by presenting the participants' groups in various relations to each other. Thus, the individual experiences are analysed at the same time as comparisons are made.

Specifically, the elaboration develops around three axes:

1. *Critical thinking – the participants and their experiences.* The following groups are presented in comparison to each other: a) School 1 → students and teachers within each studying direction; students from the different studying directions; teachers from the different studying directions; principal, teachers and students. B) School 2 → students from the three classes; teachers from the three classes; students and teachers; principal, teachers and students.

2. *Critical thinking- the two school cultures.* The principals from the two schools are compared to each other. Implications concerning the influence of the school culture on the conception and application of critical thinking by teachers and students are made.

3. *Critical thinking – the metamorphosis of a concept.* The experiences of critical thinking all the way from G. Hernes to the individual student. Specifically, the following are presented: a) the gestalt of meanings conveyed by G. Hernes; b) the gestalt of meanings conveyed by the Pedagogical Leader; c) G. Hernes's experiences in relation to all the other participants.

Moreover, I have chosen to present the results on learning strategies keeping critical thinking –the chief theme- in mind. The analysis of learning strategies is thus discussed in a manner which elucidates further the meanings conveyed by the experiences of critical thinking.

During the elaboration, some quotes from the data⁹⁸ are given, to support the results and comments made. The quotes are translated in English; the number of the meaning unit the quotes pertain to, is given in parenthesis. It should be noted that the given quotes are representative of what is being claimed, and not exhaustive.

Corresponding results tables will be given with each comparison to facilitate the presentation.

4.1.1 Critical thinking – the participants and their experiences

Each school and its participants is examined separately.

4.1.1.1 School 1

The investigation of School 1 begins with the studying direction FO.

Table 4. 1 Constituents for FO - students and teachers

Critical thinking

	PERCEPTION	APPLICATION
Student (Female)	<ul style="list-style-type: none"> ◆ Evaluation of one's work 	<ul style="list-style-type: none"> ◆ Independent work with evaluating work pieces ◆ Making decisions about work matters
Student (Male)	<ul style="list-style-type: none"> ◆ Examination of learning object ◆ Being aware of the central aspects of the working process It requires: <ul style="list-style-type: none"> ◆ previous knowledge ◆ working rules 	Presentation of one's work
Teacher	<ul style="list-style-type: none"> ◆ Theoretical explanation of the practical work ◆ Evaluation of work based on pre-determined criteria & the others' work It requires: <ul style="list-style-type: none"> ◆ knowledge of the central aspects of the working tools It is enabled by the physical proximity in the class	<ul style="list-style-type: none"> ◆ Under 3 types of assessment; criteria: students choose, are given, none specific ◆ Occurs constantly

Learning strategies

	STUDENTS	TEACHERS
Student (Female)	<ul style="list-style-type: none"> ◆ Reading through, notes, key-words in relation to the goal ◆ Heard only once ◆ Rather demanding ◆ Sporadic use 	<ul style="list-style-type: none"> ◆ When asked: points out what to read. ◆ Regards their instruction unnecessary
Student (Male)	<ul style="list-style-type: none"> ◆ Harmonisation with teacher's expectations & learning goals 	Only when asked: further clarification
Teacher	<ul style="list-style-type: none"> ◆ Knowledge of criteria ◆ Consistent work ◆ Practice in communication ◆ Review of previous work 	<ul style="list-style-type: none"> ◆ Explain & analyse goals ◆ Locate the difficulties

⁹⁸ The raw data and its analysis can be found in 'Appendix A', 'Raw data and analyses'

Concerning the *perception* of critical thinking, the *female student* supports that critical thinking embraces the evaluation of the work produced. This evaluation involves examination of working alternatives, regarding working methods and tools. Their identification is followed by analogous decisions that can improve the working product, which is also the final goal of the evaluation.

"If I make a painting and it is possible that I'm wondering perhaps if it would have been better had I used other colours and had I changed the composition" (1).

This process is not carried out by the students alone, but with the help of the teachers.

"They [the teachers] help us to start finding out what is best etc. but we must decide on our own if we will change and what we think is best, and they give us advice and guidance" (3).

Specifically, the teachers point out the working areas where alterations can be made and provide the students with various suggestions which address working tools and methods. The students, in turn, take the final decision on where and how those alterations will be made. Their role, in other words, is to take the final choice out of given possibilities.

"[...] so he [the teacher] comes with advice on changes, perhaps use of materials and so on, it is us who decide." (3).

The *other*, hence, plays a significant role in critical thinking. The suggestions and observations made on one's work are requisite in the improvement of the work. The other offers a different perspective and enables further elaboration and examination of own productions.

Critical thinking for the *male student* is twofold. Firstly, it embraces the examination of the information received, with the aim to identify the central points of the information and reveal its meaning. In other words, critical thinking includes active reception of the given facts, so that a personal standpoint can be formed.

"To question things and not to accept everything passively, to question...try to go a little deeper, try to find the essence in it..." (1).

Secondly, critical thinking includes thorough examination of the working process, meaning of the working methods and tools used. One should be fully aware of the above process, and capable of presenting and explaining it in detail. This regards both the type of means used, and the reasons why they were used.

"This that the teacher [...] wonders if we were aware of the choice of the various techniques, if we were aware of the expression we made" (2).

Demonstration of critical thinking requires theoretical knowledge on the learning object; knowledge on working methods and tools is included. Moreover, one should master the rule-frame that governs the production of a work piece. All of these constitute the criteria with which the evaluation of the working process and product is made.

"[...] [can] go through the artistic techniques, see if the person has taken good advantage of them [...] according to what we have learnt, for example colours and subject-area knowledge...laws of the perception." (1).

The procedure of employing critical thinking has not been the object of learning at FO. The student says they are rather taught *what kind* of factors and elements to look for -under for example the assessment of a work piece- and not *how* to actually further elaborate those elements and come to own conclusions.

"[...] I think we have mostly learnt what we should think about, of critical thinking and what kind of things we should look for, but not how we do it, that's what I think." (3).

Regarding the *teacher* of FO, critical thinking is presented under the pair of theory-practice; it comprises of the theoretical explanation of the executed practical work. The students, in other words, are required to comprehend the theory in such a way that enables them to apply it in practice. This connection is essential in order to carry out the working assignments.

"[...] It is related to the practical work, which is -the way I understand it- that you work with things in practice and then you go back and discuss it and talk about what you have done [...] (1) and in that way, it is a kind of exchange between what you learn and hear in theory and what you do in practice [...]" (2).

Specifically, a theoretical explanation includes a presentation and analysis of the working process. The students have to present the type of tools and method applied, and elaborate the reasons for this particular choice. The main axis around this explanation is the goals set; awareness of which goals were involved and how they were obtained, is requisite. The working process, in other words, includes choice and application of certain methods and tools, in accordance with the working goals.

"[...] and then they [the students] will present the other's drawing to the class. And then they say a little bit about which working means are used and at the same time a little bit about the various goals and how they managed to achieve them [...]" (8).

In addition to the awareness of the working process, critical thinking also includes evaluation of one's work. The students assess their productions by comparing them to two

main categories of standards; those form the evaluative criteria:

a) the others' work, meaning the students', teacher's and professionals'.

"[...] and compare [the work] with what the others have done. And you can go to exhibitions, look in the books" (1).

b) the working goal that was set at the beginning of the work; this goal is regularly taken out of the subject syllabus.

"[...] then we talk about how you have worked according to that goal that the assignment had and in a way this goal becomes the standard." (3).

The comparison of the product to the goal is executed both at an individual level, and under discussion with the fellow students and the teacher.

"and so they [the students] will be assessed against it [the goal] both on their own, they can assess themselves against also other students and teachers [...]" (4).

This co-evaluation is quite common in FO; it takes place constantly during the lessons, as it is an integral part of the students' learning. This is partly explained by reference to the practical nature of the work; the production of an item calls for assessment of the various means used throughout the whole process, both during and after its fulfilment.

"[...] it is constant evaluation according to the work's volume, when we finish with the work, there is constantly an evaluation [...]" (7).

Moreover, the particular class structure facilitates co-evaluation. The students are sitting close to each other, so that looking at each others' work and talking about it is unavoidable.

"[...] to evaluate, it goes on all the time actually, even though it is not in the everyday agenda, it will go on between the students because they are sitting next to each other. Their work is very clear [to see] so it will constantly be like that, that you look over 'ah, yes, you have done it like this. I have done it like that, why have I got this when you got' [...]" (7).

The teacher here addresses the issue of the *other* in the evaluation process. The other's work functions as a means to compare one's own work. It is implied that analogous discussions between the students take place; the other is also a discussion partner. Critical thinking, in other words, involves the participation of the other; it is not a solitary activity.

Moreover, in order for critical thinking to be employed, certain conditions have to be satisfied. Specifically, the students should possess knowledge on the working tools. They should know the various types available, what purpose they serve, how and under which

circumstances they are used.

"[...] every time we evaluate, we talk about the working means, what you use here to create perception to this picture, here to create volume, what have you used here [...]" (12).

This knowledge is acquired via the presentation and discussion of the above characteristics and functions of the tools -between the students and the teacher. This exchange takes place during all the phases of the work, i.e. during its planning, execution and evaluation.

"[...] we have various working means that we use to achieve that [a goal]. And we go through those working means from the beginning and we talk about them thoroughly, both while we work in practice and a little bit on the blackboard, in the meantime, so they take notice of the various working means and also during every time we evaluate, then we talk about the working means.[...]" (12).

Solid possession and effective use of this knowledge requires repetition. At the same time, the presentation of this information should be done progressively, with more complex issues building on simpler ones.

"[...] it is in a way a gradual, you start with simple things and then you build on little by little." (12)

Subsequently, it can be said that the development of the ability to demonstrate critical thinking comprises of the development of knowledge on the working tools and their use; it is a gradual process.

Seen together, the perception of critical thinking according to the two students and the teacher of FO is quite similar, as they all include work examination and evaluation.

For the female student, specifically, this means analysis of the means and method used, and consideration of alternatives. For the male student, this examination includes both elaboration of the work and awareness of the process followed. For the teacher, evaluation of the work is central and it involves solid theoretical knowledge.

Parallely, all the participants imply the presence and role of the *body* in critical thinking. They refer, namely, to the use of appropriate materials and tools, under the execution of the desired goal. Alternative means have to be examined, so as to improve the work. The female student, for example, mentions the use of another colour; she has to 'see' whether the colour fits, be it in imagination or reality. She must take with her hands another tool and use it to carry out the same process, so as to decide which one fits the situation best. Bodily senses, in other words, play a significant role in the demonstration of critical thinking, as they are factors contributing in work evaluation and examination.

A slight differentiation appears when the way and the criteria according to which work examination is carried out are examined. The teacher mentions various standards according to which one's work is assessed, with a particular emphasis on the goals set beforehand; they comprise the principle evaluation criterion. Those goals can sometimes be personally determined, but are mainly taken out of the subject syllabuses.

"[...] they [the students] should have picked goals from the syllabus, according to which the drawing will be assessed.[...] (8) [...] they will look at goal 1 in drawing, which regards observing and reproducing an article [...]" (12).

In contrast to the teacher stressing the importance of externally determined standards as evaluative criteria, the students rely more on personally appointed standards or on the working framework. They mention for example:

personal preferences (female);

"[...] I'm wondering perhaps if it would have been better had I used other colours and had I changed the composition [...]" (1).

creation of personal meaning (male);

"[...] try to go a little deeper, try to find the essence in it [...]" (1).

theoretical knowledge (male)

"[...] according to what we have learnt, for example colours and subject-area knowledge...laws of the perception." (1).

Hence, it seems that the students view this work evaluation in a more holistic way, meaning they examine whether the product is 'correct' in relation to general subject rules, and whether they have followed the right method and used the right material. The teacher however, is mainly concerned about whether the work produced is satisfactory in relation to the syllabus's goals.

Another point of difference concerns the development of the ability to employ critical thinking -whether and how it is promoted in the classroom.

The students on the one hand, do not express receiving analogous training. According to the female student's experience, the teacher's assisting role in the improvement of the work is to provide with alternative options; the students choose out of them. It is thus implied that the development of the ability to employ critical thinking is limited to the exercise of *how to choose* in the best way out of *given alternatives*. As seen above in the female student's description, the students do not get training onto *how to arrive* at those alternatives themselves. However, the student experiences this identification of alternatives as pertaining

to critical thinking.

"If I make a painting and it is possible that I'm wondering perhaps if it would have been better had I used other colours and had I changed the composition...I use sketches and such to find out about if various compositions and similar things fit" (1).

Even though the above excerpt does not state clearly exactly what this examination of alternatives includes, the whole of the student's experience can provide support for the above implication. Specifically, she elaborates on that the students are working mainly on their own, and are thus responsible for their work. This signifies that part of their responsibilities should also address decision regarding work improvement. Hence, by directly providing those work alternatives and thus depriving the students of the identification process, the teacher does not fully train the students in exercising critical thinking.

The male student expresses this lack of training in a more direct and clear way. As presented above, he talks about receiving education on what should be the *object* of one's elaboration and not the *way* to proceed with it.

The teacher, on the other hand, experiences that the students *are* educated into how to demonstrate critical thinking, as they gradually develop their knowledge on the working means and methods. Corresponding information is given to them, and relevant discussions take place before, during and after the execution of the work. The teacher feels this process takes place continuously, as their work has a very practical character and is an object of continuous evaluation.

"[...] We work very practically [...] (6) [...] to evaluate, it goes on all the time actually [...]" (7).

Subsequently, a difference is found between the teacher and the students regarding training into critical thinking, even though their perception of critical thinking is quite similar. Two possible explanations can be given; firstly, the students cannot actually ascertain the connection between acquisition of the knowledge the teacher talks about and critical thinking. Despite the education they receive on various methods and tools, the students do not connect that with the application of critical thinking. Secondly, the training offered in the use of tools and methods does not suffice for the employment of critical thinking. The students feel they do not learn enough in order to examine their work, and thus express a lack of training on critical thinking. However, this point needs further investigation, as the information at hand does not allow final conclusions.

Turning now to the participants' experiences concerning the *application* of critical thinking in the classroom, the following can be said.

The *female student* explains they apply critical thinking as the teacher gives them the opportunity to examine work pieces autonomously. They could be either their own or somebody else's.

"[...] We work very independently so we get a composition that we either have made ourselves or that the teacher has made [...]" (2).

This examination consists of assessing the work piece; the students are given the freedom and responsibility to carry out this evaluation by themselves, both individually and in co-operation with the other students. The teacher contributes to this process when and if asked.

"[...] the teacher is there if there are things you need help with, but otherwise it is very free to sit there and get critique both from oneself and the others [...]" (2).

In addition, the students feel mainly in charge of choosing what and how they will make necessary changes in their work, so as to improve the results. Again, the teacher is willing to provide help on the way.

"[...] they [the teachers] help, so we get on with the process of finding out what is best and so on, but we have to decide ourselves if we will change and what you think is the best [...]" (3).

The *male student* indicates they have the opportunity to apply critical thinking when they present their work to the class. Under this presentation they analyse the working article in a detailed manner, meaning that they describe the working process, materials and methods used.

"[...] after the end of the assignment, we go through it thoroughly, the students stand and talk in front of the class and go through the various working means [...]" (2).

However, the student feels that the opportunity to employ critical thinking in the classroom is not adequate; the aforementioned presentation does not include or demonstrate critical thinking elements at a satisfactory degree.

"[...] But it is not so critical, it is a little critical in a way, it is not, it could have been more critical [...]" (2).

Specifically, it is meant that the teacher does not act accordingly, so that the students ponder over the working process and means used. The teacher is expected to either check and identify lack of comprehension and provide the necessary explanations, or stimulate the students so that they become aware of the working process followed and means used. Lack of

this practice from the teacher's side leads to lack of the required awareness, which compounds part of critical thinking. Not all students achieve at a comprehension of the working process, or they do so in an incomplete manner. This is indicated in the student's answer to the question on what is the 'critical' element within the presentation of one's work.

"[...] This, that the teacher takes up things that the others do not understand or that he wonders whether we were aware of the choice of various techniques, whether we were aware of the expression we made." (2).

The application of critical thinking according to the *teacher* takes place under three kinds of work evaluation that the students execute during the school year. The chief difference between those evaluation types lies in the criteria used.

The first evaluation type occurs rather often. It involves group-work; pairs of students discuss the working assignments they have both chosen and produced. Investigation of the working means and methods is included, followed by work presentation. The students analyse to the rest of the class the other's work, including the aforementioned discussed themes and the evaluation of the work. The evaluative criterion here is individually chosen goals from the subject syllabus.

"[...] they have chosen goals from the syllabus, according to which their drawing will be assessed [...] so they sit together two and two [...] and they ask each other and they will present the other's drawing to the class. And there they say a little bit about which working means are used and at the same time about the various goals [...] It is a type of evaluation that goes on every week." (8).

The second evaluation type takes place after longer time periods and is directed toward a number of fulfilled work assignments. It involves both co-evaluation and self-evaluation of one's work, meaning evaluation in co-operation with other students and the teacher, in addition to one's own. The evaluative criterion is given; namely predetermined goals from the syllabus, divided in smaller parts that the student has to check in relation to his/her work. In other words, the student controls the achievement of each sub-goal in relation to each of the working assignments.

"We also have at the end of a learning unit –where we have divided the year into eight learning units- we have an evaluation. They receive a form where up and down on it, it says means and means, and the assignments are written downwards. And there are the goals for each assignment and then they can, they will go together in the group first, and discuss the drawings a little bit together, but they will evaluate them on their own, put a cross on where they think about their own drawings. (9) And I also do the same [...]" (10).

The final kind of evaluation occurs without following any specific plan. When they

have produced an amount of work, the students discuss it all together as a class. The evaluative criterion here is not specified.

"But we can also have a totally informal [evaluation] which we just, when we have done enough [assignments], we hang them up and then look at them, without having any special evaluative criteria, we just talk about this and that.[...]" (11).

In this last case, the students are expected to use their knowledge on the use of various tools, which has been acquired throughout the year. Their task is to apply this knowledge by examining each assignment in relation to how and why the particular means were used.

"[...] we have various working means that we use to achieve that [a goal]. And we go through those working means from the beginning and we talk about them thoroughly, both while we work in practice and a little bit on the blackboard, in the meantime [...]" (12).

Beside those three specific types of evaluation, the teacher emphasises that the application of critical thinking takes place actually throughout the whole year. It is constantly present, in the same way that the evaluation of the work is constantly present.

"[...] to evaluate, it goes on all the time actually, even though it is not in the everyday agenda, it will go on between the students [...]" (7).

Hence, an examination of the students' and teacher's experiences with the application of critical thinking, reveals an agreement on that the opportunity given regards evaluation of one's work. The female student stresses that they work on their own with assessing work articles; the male student says that they present their work to the class by examining the methods and means used, and the teacher describes three types of evaluation the students are engaged in.

Another common element found is the presence of the *other*. Both the students and the teacher refer to the application of critical thinking not as a sole activity, but as a co-activity. Evaluation of one's work, for example, takes place by using the other either as a point of reference, or as a discussion partner. The teacher emphasises the significance of physical proximity; as they students sit close to each other, elaboration of the working process takes place under exchange of observations. The presentation of one's work is done in front of the class, so that the other students can provide feedback. Critical thinking, in other words, involves co-operation with relevant others.

However, the participants' experiences also seem to encompass a dissimilarity regarding the application of critical thinking; this stems chiefly from the male student's and the teacher's experiences. On the one hand, the student feels the teacher should ask for a

deeper analysis of one's work, for a more solid demonstration of the students' knowledge and control over the working process. On the other hand, the teacher accounts for more than one occasions when application of critical thinking occurs; she talks about it being a perpetual activity and also identifies three particular cases.

Hence, the unlikeness between the male student and the teacher's experiences does not actually concern the *opportunities* provided, but rather the *degree* of critical thinking actually applied when given the chance.

Turning to the issue of *learning strategies* and specifically to the *students' techniques*, it is first observed that all the participants recognise the importance of knowing and being constantly aware of the learning goal.

The female student mentions isolation of the main points in the learning material in relation to what the goal asks for, as her chief studying method.

"[...] It is mostly to read it [the learning material] once and take notes [...] of stuff you know is important in relation to the goal and then read the notes and perhaps read the book two times so you understand it before you write down key-words." (4).

Likewise, the male student acknowledges the significance of studying the learning material in such a way that the requirements of the syllabus goal are fulfilled.

"[...] we are given a goal, in the beginning, and we must study what the goals include for the [...]written exams. So we have a goal that the students shall know the difference between positive and negative form, for example, so it is smart to have studied that [...]" (5).

The teacher, finally, stresses solid knowledge of the evaluation criteria -and subsequently of the syllabus goals, as one of the requirements for a successful exam preparation.

"[...] be aware of the goals, and then they [the students] have to know what the goals are about because it is according to them, that they will be assessed." (13).

The acknowledgement of the goals' salient role to an effective studying is in accordance with the employment of critical thinking as presented earlier by the teacher, meaning the examination and evaluation of one's work in relation to the goals' requirements.

Interestingly, even though the students do not mention the syllabus goals as one of the evaluative criteria under the demonstration of critical thinking, they still identify them as one of the principle elements they keep in mind while studying. A possible explanation of this diversity is that the students consider the syllabus goals as essential only when it comes to theoretical work and exams. It could be that the goals' role in the execution and evaluation of

the work in practice, is not as intense.

Two points in the students' data support the above assertion.

Firstly, the male student mentions also that harmonisation with what the teacher considers as necessary and important, guides his exam answers. The student tries to fulfil the teacher's expectations, even if he actually has a different opinion or way of presenting his work.

"[...] [we] have answered the assignment in practice, and then we will have a written [exam] day and we will explain what we had done, we would explain concepts and such things. To make it well in such an exam, I feel—and perhaps many others feel- that you have to in a way do what the teacher expects us to do, I think it will be difficult to dare do something which is quite provoking [...]" (4).

Consequently, the consideration of the syllabus goals –which is highly promoted by the teacher- as a major part of the students' studying could be mainly due to the above attitude the student has, to adjust and provide what the teacher expects to receive.

The second element comes from the teacher's data. While describing her role in helping the students prepare adequately for the exams, she observes that a considerable amount of time is spent on the analysis and clarification of the syllabus goals. According to her, the goals carry the potential of being misunderstood or of remaining incomprehensible, as the way they are formulated is complex and obscure.

"[...] we take the goals thoroughly and read them and talk a bit about them, whether it is someone who does not understand this and that word, (16) I think that a lot of it is explained in a difficult way, I think it could have been done in a totally, a lot can be interpreted differently" (17).

The unclear and imprecise nature of the goals, might thus be one of the reasons why the students do not recognise their contribution while working in practice, as they have not managed to fully comprehend them.

Accordingly, the explanation of the aforementioned discrepancy concerning the presence and degree of training into critical thinking between the students and the teacher, can be partly located in the students' failing to completely understand the goals' content and function. The students are not fully capable of recognising the connection between instruction on the goals and demonstration of critical thinking, as they have not perceived the importance of the first for the latter.

It should also be remarked here that the teacher actually seems to be aware of this situation, as she stresses the significance of achieving a common understanding –between her and the students- on what the goals contain, and how they can be achieved. This is also one of

the major reasons why she devotes large amounts of time to the goals' analysis and elaboration.

"so it is important that we at least agree on what it is, what the content of the goals means...that I also know that they [the students] know what it means." (18).

When it now comes to the *teacher's role*, the experiences of the students and the teacher are rather diverge. The students feel they do not receive particular training on learning strategies, whereas the teacher has a different opinion.

The female student specifically, says that the teacher does not include instruction on learning strategies.

"[...] we do not get any special advice on how we shall read [...]" (7).

The student feels it is assumed that she already possesses knowledge on studying methods, and thus the teacher provides help only when specifically asked. The kind of help provided, though, is not actually on *how* to elaborate the learning material in order to have an effective learning, but on *which parts* of the material are more important.

"[...] he [the teacher] advises us perhaps on what is clever to read [...] they expect maybe that we know ourselves what is best for us [...]" (7).

But do the students truly know best? In this particular case, the answer is negative; the female student says she has only had short training with studying methods in the previous year. She considers studying with use of those techniques a fatiguing and difficult process; she thus makes use of them only in some cases, rather infrequently.

"[...] It was last year, in the foundation courses [...] it was like a course, it was many hours, so we learnt about that...studying techniques [...] (5) [...] it was a very advanced technique, it was a lot of work, but sometimes I use them, or I feel they can be used." (6).

Seemingly, the male student remarks categorically that he does not receive any help with how to study effectively and hence prepare adequately for the exams. On an analogous question, he answers;

"[...] No! He [the teacher] hasn't [...] he has actually not done much [...] with this exam form we had now, so we got to know very little actually [...]" (6).

The student says though, that when asked individually, the teacher does provide help on studying methods. Again, the kind of help is directed toward the explanation of difficult parts in the learning material, and not on *how* to deal with them.

"[...] I get help if I ask, I believe [...] clarification of the theme...I believe there is not so much more to do...I don't think there is so

much more than that." (6).

The teacher, in contrast, considers the thorough analysis of the syllabus goals together with the isolation and further clarification of complex parts in the learning material, as help on learning strategies from her side.

"[...] this that we try to put weight on [...] is that they will be evaluated out of the goals, so we take the goals thoroughly and read them and talk a bit about them, whether it is someone who does not understand this and that word (16) [...] We must try to talk to them, what it is they think is difficult." (19).

As seen from the above, there is a certain discrepancy between the students' and the teacher's experiences of the latter's role in providing instruction on learning strategies. This also insinuates that the lack of training felt by the students on critical thinking is partly due to the lack of training in the *means* necessary to demonstrate critical thinking, meaning studying techniques. Insufficient knowledge on how to elaborate the learning material for example, does not allow a full theoretical explanation of the working process, or for a thorough exploration of the alternatives existing for the improvement of the work. When for example, the teacher expects the students to use their knowledge on the working tools and materials, in order to evaluate a piece of work –and hence to employ critical thinking- the students fail to see this process as being part of their training on critical thinking. They do not initially, possess the required techniques that allow them to elaborate and learn the working tools.

What are the factors involved in the discrepancy found between the students' and the teacher's experiences of critical thinking? It is prosperous to advocate that this discrepancy suggests an *insufficient communication* between those two groups. It seems that the role, significance and function of the central elements involved in the critical thinking process do not convey the same meanings for both students and teachers. A non-agreement on such points can lead to the differences analysed above, and perhaps to many others that have not been in focus here⁹⁹.

After having analysed the data provided by FO, the next studying group investigated is DD.

⁹⁹ As it will be shown further on, this kind of diversion is present in other studying directions and between other groups as well; it is again suggested that the communication between those parties has not been fully successful.

Table 4.2. Constituents for DD - students and teachers

Critical thinking

	PERCEPTION	APPLICATION
Student (Female)	<ul style="list-style-type: none"> ◆ Examination of information ◆ Evaluation of the work Prepares for criticism (evaluation)	<ul style="list-style-type: none"> ◆ Express one's opinion ◆ Suggest work alternatives
Student (Female)	<ul style="list-style-type: none"> ◆ Examination of information ◆ Examination of the working process It requires: <ul style="list-style-type: none"> ◆ favourable milieu 	<ul style="list-style-type: none"> ◆ Evaluation of one's work
Teacher	<ul style="list-style-type: none"> ◆ Analysis of work ◆ Evaluation of work based on objective & subjective standards It requires: <ul style="list-style-type: none"> ◆ experience 	<ul style="list-style-type: none"> ◆ Due to the nature of the subject ◆ Work journals ◆ Observation & participation in work

Learning strategies

	STUDENTS	TEACHERS
Student (Female)	<ul style="list-style-type: none"> ◆ Estimation of time, read once, notes of: important parts & what she lacks knowledge for ◆ Heard once: isolate main theme, skim, gradually go into details ◆ Sporadic use 	<ul style="list-style-type: none"> ◆ Repetition ◆ No encouragement for use
Student (Female)	<ul style="list-style-type: none"> ◆ Additional sources, constant work, concentration ◆ No training ◆ Not necessary to use 	<ul style="list-style-type: none"> ◆ No help since their use is not necessary
Teacher	<ul style="list-style-type: none"> ◆ Knowledge of evaluative criteria ◆ Pondering over working process ◆ Studying others ◆ Review of previous work 	<ul style="list-style-type: none"> ◆ Advice on group-work

The *perception* of critical thinking according to the *first female student's* experience is twofold.

Firstly, investigation of the information acquired is involved. This investigation aims at the discovery of the righteousness of the facts given, so that one can assume a standpoint. A deeper analysis of what appears to be valid on the surface is necessary, so that either to accept the information as reliable or to reject it.

"[...] it means not to accept all as it is, to question the situations."

(1).

Secondly, critical thinking embraces evaluation of the working product. This evaluation is directed to the examination of the various aspects of the result achieved. As we are dealing with drama, this concerns the elements involved in a theatrical performance, for example 'correct use of space'.

"[...] If for example it has to do with direction things, then some of the students can say 'no, I think it is better that...that this here has

been a messy stage picture. Can you for example sit there instead, or can you find a new solution?" (3).

As indicated by the student, a result of the critical thinking process is to exercise criticism, meaning to point out the weaknesses of a working product. The purpose of such a criticism is to replace the working techniques, materials, and processes in order to enhance the result.

"[...] the next stadium will be perhaps to give criticism [...]" (2).

This work evaluation is carried out at two levels. Firstly, the persons engaged directly in the production and execution of the work evaluate the result themselves. Secondly, those foreign to the working process -i.e. the observers of the performance- express their judgements.

"[...] we produce often [plays] in such a way that we show it to each other, and there is a small group which observes and watches and can give constructive criticism afterwards [...]" (2).

The student underlines the importance of receiving an evaluation from the observers' group, by using the adjective 'constructive' criticism. She explains that the members of this group have a more objective standpoint than the members of the working team.

"[...] because they are much more objective than us who have worked with that thing [the performance [...]" (2).

Additional explanation of the term 'objective' is needed; the student indicates that since this group's members have not directly participated in the working process, they can detect weaknesses and improvement potential that the working team cannot. In the direct question whether one has to be objective in order to demonstrate critical thinking, the student answers:

"[...] No, you don't have to be that, not at all, no.[...]" (2).

In other words, the student does not claim that demonstration of critical thinking requires an objective attitude; she rather advocates that when evaluation of a self-produced work takes place, the direct personal involvement in the working process does not allow detection of all the possible flaws in the result. The person has thus to stand 'outside' of the situation and investigate it with the eye of an observer, in order to identify elements that would otherwise be missed.

"[...] But it is often perhaps easier, first you are critical yourself, the little group you work in, but then it is often...or the new ones can often come with good constructive criticism in addition to the one we have managed to come at within the group" (3).

Work-evaluation is executed under group-work; this implies that critical thinking is an activity performed in relation to the *other*. The evaluation of one's work involves feedback from the others, exchange of opinions and decisions taken under a co-operation. A solitary activity is not productive, as the other is in an advantageous position, regarding detection of eventual weaknesses.

Furthermore, this evaluation can be directed to both negative and positive aspects of the work, since it is directed toward improvement. Part of the students' training includes development of an understanding for the evaluation's importance; it contributes to self-awareness regarding the quality of one's work, for it points the person's attention to crucial aspects of the work.

"[...] it is important to say something positive first, perhaps, and then come with the constructive criticism and we talk very much about the fact that we shall tackle criticism, that criticism is not negative, it is just guidance to things that will be better." (4).

Consequently, according to the first student, critical thinking is an important and inseparable part of the working process that provides with self-awareness and enables improvements to take place.

In agreement with the first student, the *second student* understands critical thinking in two ways; examination of the information and the working process. However, certain differences also appear.

Regarding the investigation of the information given, some additional elements are indicated by the second female student. She too stresses the importance of analysing and not accepting the information as true and valid at once; however, she also specifies that this analysis should include adoption of various points of view the information could be viewed from, so as to form a personal standpoint.

"[...] that one can see things from different sides and form a judgement about things without accepting what someone says, immediately [...]" (1).

In order for this investigation to take place, certain conditions are requisite; access to informational sources and an attitude of openness. The student indicates that when one examines given facts, one should be able to read the original sources the facts are referring to, so as to verify their truthfulness. The same concerns the others' appraisals regarding the importance and quality of objects or situations; direct contact with those objects and situations is required, so as to be able to contemplate on them and express a personal opinion.

"[...] it is very little like this here at least, that it expects that we shall

be critical and it expects that we shall form our own opinions, out of reasoning, because rarely do we read the literature pieces we hear about, we read about them in the books, we read rarely the pieces in order to form our own opinions about them.[...]" (2).

At the same time as access to informational sources is required, the willingness to provide the students with the opportunity to actually question and investigate the given facts and appraisals should be present. This open-to-an-examination attitude concerns mainly the teachers; they should intrigue the students to dispute the presented statements and judgements and to eventually argue for or against them.

"[...] [in] certain courses [...] it is very much like that clearly, that it is decided what we shall learn, for example in History of Literature, what we shall believe about Ibsen and Bjørnson [...] and all the writers [...] when it talks about them in the textbook, then it is very much decided beforehand what we shall believe about them, we are never challenged to be critical to the big writers [...]" (2).

Concerning the other form of critical thinking, namely the analysis of the working process, the second student talks about more aspects of the process, whereas the first student is focused on the working result.

"[...] we shall reflect over what we have done, we are told whether we shall talk about the various things we have done, describe exercises and such, and we shall write a little bit about why we do them and what we got out of it, and how, what we learnt of it [...]" (3).

Hence, the student also refers to the understanding of the reasons for which the work is carried out and of what was acquired/achieved. In other words, the student indicates that critical thinking leads to the development of a self-awareness regarding the purpose of one's work and the benefits gained.

Included in this type of work analysis is also the evaluation of the achieved results. Criticism of each other's work takes place, with a focus on what could be improved. The student refers to the evaluation performed by those who are not directly involved in the work production -as the first student did. When the second student, though, explains the importance of such an evaluation, she also attributes an instructional purpose to it. By being exposed to their comments, the working team is trained into discovering the elements the 'external' group indicates. Thus, the students become eventually capable of identifying potential improvements on their own.

"[...] we give criticism to each other when we do things, that we manage to learn to see what could have been done better in a way. Because when we for example work with projects, then those who are not up on the stage are sitting and watching and giving criticism on what is being done [...] we are trained in a way to be critical to

theatre." (4).

Hence, the student here connotes once more the importance of adopting a different perspective while performing an evaluation –and subsequently while demonstrating critical thinking. In other words, she acknowledges the contribution of the *other* in critical thinking, as the first student did.

Finally, she mentions that this evaluation can be of both a negative and a positive character. She thus implies the evaluation's importance to the development of the ability and skills necessary to perform self-assessment, as seen also in the first student.

"and giving criticism on what is being done, both positive and negative" (4).

Albeit beneficial, criticism carries a potential adverse effect; focusing too much on identifying the negative aspects of one's work -where enhancements could be made- may deprive the person of the enjoyment a performance can give. Instead of being receptive to the performance's messages, and of experiencing freely various feelings and thoughts that might arise, one is selectively attentive only to the flaws the performance might have, and thus misses the whole of the experience.

"[...] it becomes somehow extreme, because now I am such that I cannot watch a theatrical piece anymore...because it is totally destroyed, as we only see the negative things, even at the professional theatre you see only at the bad things, you do not manage to believe it is good in a way..." (5).

Critical thinking, thus, might lead to a unilateral examination of the object under scrutiny, which counteracts the appreciation of the positive aspects of the object.

The *teacher* of drama experiences critical thinking as comprising of two components; work analysis and work evaluation.

Work analysis incorporates retrospective reflection over the working process. Specifically, under a work project, the students are expected to explain the actions taken, the methods and means used. At the same time, they should present the reasons why this project has been carried out, meaning the purpose it served and what the students learnt out of it.

"[...] When it comes to production, I have to write a log, for example, it is a kind of reasoning, a kind of reflection over what I do. So that I attempt to understand why I do things and in a way to get a kind of intelligent understanding on how things should be done, how they can do it. [...]" (6).

In other words, critical thinking in the first sense promotes self-awareness concerning

one's knowledge and actions.

Work evaluation insinuates assessment of a theatrical production and its performance. The teacher indicates that this evaluation is done according to certain criteria/standards.

"[...] it has to do with evaluation, but however must evaluate expressions against standards [...]" (1).

Those standards are twofold; of an objective and a subjective nature.

"Some will always think a piece is good, while others think it is bad [...] (9) [...] but at the same time the way you work with it, you introduce some concepts that have to do with the profession" (10).

In the first case –the 'objective' standards- two groups are mentioned; the curriculum goals and the professional theatrical performances.

The teacher explains that each project is carried out according to specific goals taken out of the curriculum. The students are made known to this situation, meaning that they are told beforehand which goals apply on each project, so that they can execute the work accordingly.

"[...] The way it will be done is that when they get an assignment, for example it can be a project that they will work with for a period, they get a written report, where the curriculum goals out of which they will be evaluated, are written.[...]" (11).

With regard to the second group of criteria, the teacher indicates that the methods used and the working process followed by professionals is a desired goal. The students should exercise in developing similar working production routines and in achieving a result –a performance- that can be compared to a professional one. Observation of such work and comparison with one's own is requisite.

"And this to evaluate utterances, this you have to learn through working on your own, but also through watching the others' productions and evaluating them of course, comparing it with what you made yourself, to watch professional theatrical performances...So in a way we can say that one can watch the professional performances, they are like a kind of standard that set a kind of goal, or that the way they do it, the professional people work in a totally different way. Then we can understand what a standard is" (3).

A more detailed examination of what is meant with the 'professional way of working' -or the standards set- reveals that the evaluative criteria applied are of a particular type. They range from somehow clear rules to more abstract elements. The teacher illustrates for example, that the performance should be well organised, with a clear structure, at the same time as it should make correct use of the time, space and involve clear communicational

patterns.

"[...] a role-person shall stay within the role, shall not fall out, that a theatrical piece shall have sort of a build-up, we see that the action goes, that it is about one thing and does not jump from one point to the other, that it is rhythmical and that it flows, that it is the tempo that in a way helps to narrate the content, such things, that you came to in a way, make out of the movement on the stage, the dynamics, such things that in a way put words to, that you get a basis for, understand it in a way" (10).

As seen from the above excerpt, the working rules that the students must work in relation to, are not always of a clearly determined character. The teacher refers to elements in a performance that one cannot give one absolute description of; it is not perhaps possible for example to define the meaning of a performance which is 'rhythmical and 'flows. So how do the students learn to identify and apply such criteria?

The answer is through experience. The teacher indicates that acquiring experience is one of the main focal points in the students' training; the students learn to recognise what a successful performance means.

"It is obvious that experience is what we work with in drama education [...]" (2).

Specifically, this experience refers principally to a practical activity, as one has to go through the stages of producing and performing a theatrical piece. Theoretical knowledge is not enough, active participation is necessary.

"[...] have to get experience in a totally different way than in the other subjects (2) [...] concerning exactly this, to make conjectures, it is in a way to make conjectures first, and then you shall in a way try to imagine things and then try to translate them in a kind of physical expression." (5).

The teacher underlines that drama differs from the other subjects. This difference addresses the 'tools' the students use in order to acquire experience. The role of the *body* is central.

"[...] use of the body and the voice and in a way that you use yourself in a greater degree in order to get experience." (2).

Elaborating this further, the teacher underlines that theory and practice are tightly connected to each other. In order to learn, the students make use of both mind and body, which work together in a harmonious synthesis. Thus, drama has a distinguishable character, as learning is a result of both mental and physical activity. The student has to participate as a whole, with all his/her senses in order to be able to understand drama in its full meaning. The

subject's nature, in other words, asks for an additional and different in character activity than pure reading-understanding.

"[...] In drama we think in such a way that there is a very close connection between body and mind, we can say that the brain, the mind, the mental is something for itself, it is side-by-side with the body, that in a way there is a connection that you –through the bodily and physical and in a way experiences, how you go through things with help of body and mind together, as we do in drama. So it is clear that, I think in a way you can understand things in a different way through for example reading it" (5).

The contribution of the body to learning in drama is also demonstrated when the teacher explains how the paragraph on 'training in thinking' in the core curriculum is understood in drama. 'Expressing oneself' is not limited to making verbal declarations after certain intellectual elaboration; bodily expression is included. One makes also use of his/her body in order to communicate messages in a complete way.

"It is obvious that this to express oneself clearly, regards perhaps not argument, disputation and demonstration, but this to express oneself clearly in drama; the theatrical work regards expressing oneself in a way clearly with one's body, as in a performance for example, so that you in a clear way manage to bring forth what you want to convey. [...]" (7).

So far, the objective standards according to which the evaluation of one's work is carried out have been illustrated; i.e. the curriculum goals and the professional theatrical performances. In the latter case, the exact criteria with which a performance is judged, are of a rather abstract nature. The students learn to identify them by acquiring experience, meaning by producing and executing theatrical pieces. Both mental and bodily activity is requisite, as communication in drama is considered chiefly a physical expression.

In the second case –the subjective standards with which work evaluation is performed– the teacher discusses the arising feeling of liking or not a theatrical performance. Each person's idiosyncrasies play a role here, as they determine the value of a performance. Specifically, personal preferences, views and interests define whether the piece is well received or not, meaning whether one likes or dislikes it. The function of those factors is often experienced in the form of emotions.

"[...] it is whether a performance for example 'moves' you, if you sort of feel that it concerns you, then you will think it is a good performance, even though perhaps not all is perfect; while a performance which is rather perfect concerning all the technical parts, if it in way does not 'move' you, so you will not like it so much [...]" (12).

Hence, the power of the emotions arising under a performance is sometimes so

substantial that it overrides the working rule standards –the 'objective' standards. In other words, the degree of emotional involvement achieved is sometimes more important than the degree of technical fulfilment to the formation of a person's judgement, i.e. to the evaluation of drama work.

"[...] the way you work with feelings in a way, it is emotions, you try to move or when you watch a theatrical performance, there is no doubt, if you are overwhelmed by your feelings then it is this that makes you like the performance or not. This is how it is with all art subjects, all artistic expression.[...]" (12).

Summing up, critical thinking according to the teacher embraces the evaluation of the working piece by applying both objective and subjective criteria, which the students learn to identify and use through the acquisition of experience.

Finally, the teacher specifies that this work evaluation is performed by both students and teachers. The students evaluate each others' work and the teachers evaluate the students. At the same time, the degree of the students' accomplishments is an indication of how well the teacher has planned and carried out the instruction, as the first is tightly connected to the latter. Hence, the teachers are also evaluated in an indirect way.

"It is obvious that this to evaluate is very important, we do it, both we, in a way the teachers evaluate the students, and the students evaluate each other. And us, certainly, it effects us in turn, if the set-up [of the instruction] functions well, we will assess it to find out, assess it out of how the students deal with it, how one does it and so on." (4).

The teacher underlines clearly here the participation of the *other* in this aspect of critical thinking, the evaluation of one's work. As indicated also above, the other is indispensable in this process, as s/he functions both as an evaluation criterion and a discussion partner. This is also indicated by the fact that the execution of the projects takes place under group-work; co-operation in the analysis and evaluation of the work is essential.

A comparison of the students' and the teacher's experience unveils that critical thinking is perceived only partly in similar ways, as the teacher does not acknowledge the information analysis as pertaining to critical thinking, in contrast to both students. She rather concentrates on the practical work, the production and execution of a theatrical piece.

However, all three participants refer to the work evaluation. They recognise its connection and importance to the drama education, as it enables identification of weaknesses and leads to work enhancement.

An apparent difference at this point is that the students do not refer clearly to the criteria according to which they perform this evaluation, whereas the teacher gives a thorough

description of them. The students seem to underline more the purpose of the evaluation; how evaluation contributes to their training and that they should learn to accept and deal with it. The teacher is mainly concerned with explaining the standards/criteria involved, how they can be identified and learnt to be used. It can thus be said that the teacher is more concerned with the actual evaluation process, *how* it should be done, whereas the students are concerned with the reasons of the evaluation, *why* it should be done.

In order to elucidate further this dissimilarity located in the aspects of the evaluation the participants emphasise, an investigation of how the participants experience training into critical thinking is required.

Accordingly, the first student acknowledges not having received any particular training into critical thinking, meaning into how exactly to perform a work evaluation. She rather emphasises once again the importance of giving and receiving evaluation; the actual process of it has not been part of her learning.

"I don't know if we have talked so much about how we think critically, we have talked more about how important it is to come, how one should come with criticism, that's what we have talked more about [...]" (4).

How about the second student? When asked whether she has received training on how to give criticism, the student responds in a positive way. She notices a big development regarding her knowledge on this point since she first started attending the classes.

"[...] Yes, all the class has learnt incredibly much on exactly that point this year, in the beginning we were not good in it at all, in the beginning there was no one who managed [...]" (7).

Nevertheless, when she tries to further elaborate on what exactly was that she had learnt, the student refers to the apprehension of those elements of the work that they should be looking for. She particularly talks about a kind of guidance from the teacher's side toward alternative ways of carrying out the work, so as the result improves. In other words, the student indicates they have learnt that certain things are not correct, and should be thus avoided.

"[...] so we have learnt...I'm not so sure ...they have managed at least to teach us what we shall look for, that if we had done it like this and this, then it would have been better, so we manage to find out how things are done wrongly, and we didn't manage that in the beginning, and I notice this at least for myself that I have learnt incredibly much on exactly that." (7).

What the student describes here as training into evaluation does not cover all the

process the teacher described. Knowing *what* should be avoided is not akin to the acquisition of the experience the teacher refers to, where the students learn what constitutes a successful performance. The development of the sense for a good performance with an active participation of body and mind that the teacher illustrates, cannot be achieved only by training students into identifying certain mistakes. Hence, what the student experiences as training into evaluation is only a part of what the teacher describes as evaluation.

Consequently, there is a certain distance between what the students experience under training into critical thinking and the teacher's experience with what is required for demonstration of critical thinking. This distance can also elucidate the aforementioned divergence found in what the participants consider central concerning evaluation. As the students do not fully possess knowledge on the constituents of the evaluation the teacher holds as important, they refer to and emphasise different aspects of it.

A further comment here refers to the above analysis of the FO participants, where a similar dissimilarity regarding the degree of the training in critical thinking appeared. It is suggested here as well, that in the case of drama, the differences in the students-teacher experiences indicate an *insufficient communication* between the two groups. The elements the teacher considers as essential and necessary for the demonstration of critical thinking, have not been wholly conveyed to the students; and the students have not fully communicated to the teacher what they perceive as central.

However, another possible remark on this discrepancy originates from the abstract nature of the evaluative criteria used in drama. As their definition and specific description is not attainable in most cases, the students cannot put words to them and describe them to the researcher. Further data is thus needed in order to clarify this point.

As far as the *application* of critical thinking is concerned, the *first student* feels it takes place as the teacher gives them the opportunity to carry out work evaluation. The students are free to express their opinion, make judgements and disagree with the way the work is produced or executed. They point out weaknesses or make suggestions, so as to enhance the result.

"[...] If for example it has to do with direction things, then some of the students can say 'no, I think it is better that...that this here has been a messy stage picture. Can you for example sit there instead or can you find a new solution?' " (3).

The *second student* feels the application of critical thinking occurs constantly, as the students are expected to perform work evaluation throughout the school year. This evaluation

is realised in two ways; with the keeping of a log, and under the production and execution of the work.

In the first case, the students are responsible of writing a report from certain type of lessons, which take place very often. The report should present personal contemplation on the classroom activities, meaning a description of them, the methods used, the purpose why those activities are carried out, and what the student learnt from them. Hence, the report includes a kind of an examination of the working process.

"[...] We write a report almost from all the theatrical production hours we have, it is 10 hours a week when we shall write report from those hours. Then they put weight on that we shall reflect over what we have done, we are told to talk about the various things that we have done, and describe exercises and so on, and we shall write a bit about why we do them and what we got out of them, and how, what we learnt of it, such things" (3).

In the second case, there is an emphasis on evaluating the work regularly, at all its stages and not just retrospectively. The students are expected to look for improvements while they plan, produce the work and present it. They are supposed to ponder on their actions all the time, and not only after they have completed them. Work evaluation is thus an inseparable part of the students' drama education.

"[...] this year it has been almost all the time...or it seemed like it is there they have put the main weight, actually, this year, that we shall manage to see critical at it, at our own projects [...] also on the way, while we work on it, it is also such that we are all the time pressed that we can do things better all the time..." (6).

Likewise, the *teacher* remarks that the students have the opportunity to apply critical thinking continually. It is firstly due to the particular nature of the subject that critical thinking is constantly present. As seen above, drama work induces always subjective factors; the evaluation of a performance is often done based on personal taste. In that sense, critical thinking is an inseparable part of drama education, as the students are continuously engaged in watching and evaluating theatrical pieces.

"[...] Critical judgement, for example. It is clear that always, when it comes to artistic expression, judgement is always in the picture [...] some will always think a piece is good, while others think it is bad, there will always be a certain degree of judgement in the picture" (9).

Furthermore, two specific cases where the students apply critical thinking are described.

Firstly, the students write a work report where they ponder over their actions. The aim is to achieve an understanding of the reasons the work is done in the particular ways, and to

identify the personal gains.

"[...] When it comes to production, I have to write a log, for example, it is a kind of reasoning, a kind of reflection over what I do. So that I attempt to understand why I do things and in a way to get a kind of intelligent understanding on how things should be done, how they can really do it [...]" (6).

Secondly, the students actively participate in the production and execution of theatrical pieces, at the same time as they observe the others' work. In this way, they train into working towards a goal, and they acquire experience, which is required in order to carry out an evaluation. This stems from the teacher's illustrations at more than one point, from the gestalt of her experience; some indicative utterances are:

"And this to evaluate utterances, this you have to learn through working on your own, but also through watching the others' production and evaluating them of course, comparing it with what you made yourself, to watch professional theatrical performances [...] (3) [...] and then it is this to think and reflect over things you have done and observe of course what the others do...to observe is also a very important part...to experiment on your own [...] (6) [...] but at the same time the way you work with it, you introduce some concepts that have to do with the profession [...] (10) [...] The way it will be done is that when they get an assignment, for example it can be a project that they will work with for a period, they get a written report, where the curriculum goals out of which they will be evaluated, are written. The goals contain in a way typical elements, so that I know, before I start, what I will be evaluated in. [...]" (11).

Summing up, the experiences of the teacher and the two students of the application of critical thinking in the classroom are very similar. They signify that critical thinking is demonstrated while the students analyse and evaluate their work, a process which is embedded into drama education.

Concerning the *learning strategies* investigation, the first student states that her studying techniques comprise in a combination of reading and writing. Specifically, the following procedure is used; organisation of time by deciding a time frame required for the reading of the learning material, reading of the material one time, and at the same time noting the most important information –in accordance with the theme of the text- and this information which is more or less unknown to her.

"[...] I have to write while I read because, or I learn more when I write, so if I first skim, and I go through and I count how many pages I have to read, to see how far it is to achieve the goal, and then I keep notes of what I know are important things [...] I see it in the title and perhaps things that I have less knowledge for, I keep notes, I go a little easier over..." (5).

The student refers therefore to ways of handling the learning written material with;

there is no direct reference to techniques that are related to critical thinking as experienced by her –i.e. information analysis and work evaluation. This is perhaps the reason why she also advocates that she does not receive any training on critical thinking, as seen above. Lack of training on one of the 'tools' that enable application of critical thinking conveys a feeling of lack of training on critical thinking.

The second student talks about the importance of working steadily and of acquiring additional information sources on the studying theme. Working with full attention is something the student has learnt from past experience, as it enhances her memory.

"[...] in secondary school I was very good, and this is still an advantage for me...because I have learnt in a way...I can just read through things and remember them very easily, in such a way that if I read concentrated through 20 pages 3 times, so I know them." (10).

Besides, studying concentrated and throughout the school year is salient in order to manage the learning material over a long time and comprehend it in a successful way.

"[...] I have noticed that it is this that counts, because if you work consistently, then you learn things much faster, then you manage to sort of keep up with. For me...if I start not to work for two months, and then I'm supposed to take hold of all that, then it will be so much stress that I don't manage to learn anything." (13).

Additional information is necessary in order to obtain a different perspective on the material, and hence be in a position to evaluate it and take a standpoint to it. The student here refers to sources both of a written form -such as books- and to other people's thoughts and knowledge.

"[...] and that I manage to bring in other things and manage perhaps to make my own opinions which do not stand in the book [...] (8) [...] I have a father who is very good in many things [...] which I notice I have good use for. So I use him very much. If I'm supposed to study for the exams, I use him very much [...] (9) [...] and then it is very good for me to use my father, to just tell him what I have read about, and then he says 'OK, but it can also be so and so', so he can fill in what I have read in the books." (11).

When she illustrates the necessity of acquiring various perspectives on the material to her better comprehending, the student also observes that when one is capable of elaborating what is given in the textbook with own opinions and thoughts, then one receives a higher grade. She acknowledges, thus, the importance of personal reflection.

"[...] I at least gain more out of it if I had managed to read it [the material], and understand it, and be critical to it [...] and perhaps, if one gets an oral exam and can discuss what stands in the book, bring in new things, then I think it will be a 6, I think it would be actually this which separates the 5 or the 6, that you can actually bring in new things and not just swallow what stands in the books and which is in

the required readings [...]" (8).

In other words, the way the student deals with the learning material -i.e. she further contemplates on it with the use of additional information sources- is a studying technique that also enables her to perform work analysis and evaluation, and hence to demonstrate critical thinking as experienced by her.

If we now compare the students and the teacher on the experiences of the students' techniques, a main difference emerges. The students are more focused on ways to deal with the learning material whereas the teacher is concerned with ways to carry out the evaluation.

Specifically, the teacher talks more about techniques that are directly connected to the practical work. She emphasises the importance of developing an understanding and an awareness of the components of the working process.

"[...] it regards reflection, in a way to reason, in a way to talk about the performance and show that they [the students] have understood if they have done it consciously and such things" (14).

She thus indicates that the students are actually prepared for the exam during the whole year, as the work analysis they carry out -i.e. the work report they write- is similar to the analysis required by them during the exams.

"And it resembles the way we work throughout the year, because then we keep a log, or a diary, or a production report [...]" (15).

In addition, she underlines that the criteria the students will be evaluated with during the exam, are made known to them beforehand. The students practice with similar to the exam situations -i.e. preparation and performance of a theatrical piece- on which they receive the teacher's comments. The teacher presents the way the pieces are evaluated, as well as the characteristics of a successful work. Hence, the students are familiar with the assessment process and are aware of what is required for a high result.

"So they receive of course feedback [...] usually we give written feedback with comments to each one and we of course try to explain what is the point with an oral discussion [during the exams], for example what it is we are after, what separates a good from a bad grade. We actually feel that there is a rather good connection between the exams and the instruction." (17).

The different angle the students' and the teacher's answer have, can of course be due to a different comprehension of the research question. This concerns specifically the first student, as the formulation of the question made her rather directly relate 'preparing for the exams' and 'studying' to written material. The second student, however, did not receive a

question which directly pointed to reading. Nevertheless, she answers the way seen above, by reference to the elaboration of the written material.

Hence, another comment can be made, especially taking under consideration the aforementioned findings on training into critical thinking. Lack of a reference by the students to studying techniques that could be directly connected to their perception of critical thinking can partly be responsible for the lack of training in critical thinking the students experience. When the students do not learn those techniques that contribute to demonstration of critical thinking, they do not learn how to apply it in an effective way.

The above assertion is also supported by the second student's observation, that she is not provided with enough theoretical basis for the work she carries out in practice. She feels it is left to her to discover the theoretical explanation of the methods they use in practice, something that she experiences in a quite negative way.

"[...] and when we get so little theoretical feedback on why we do it, then it is a little difficult to...you must sit down and read it yourself, if you are supposed to understand completely what is happening, why you learn that and why it works, we don't learn this. I think it is actually a little silly, it is sort of a letdown, but I think that perhaps we will have more about it next year. But I miss it actually this year, that it doesn't go more detailed through what happens, why we do things, because we don't get so much explanation on the things we have to do in practice." (16).

Consequently, the awareness of the methods used and the reasons for the work carried out -a central component of critical thinking- that the teacher considers salient in drama education, does not seem to be promoted according to the student's experiences. The student feels too much weight is given to practice, which results in a lack of theoretical studies and eventually in a lack of training with studying techniques. This does not enable the student to fully acknowledge the reasons behind the practical work, hence demonstrate critical thinking.

Agreeably, the first student also observes not having had any training with studying techniques in the current year, but only once in the past.

"We have had, last year we had 3 hours with studying techniques [...]" (6).

She also acknowledges not making use of them often.

"[...] Yes, partly [makes use of them]" (7).

A similar shortcoming when it comes to studying techniques is met when the *teacher's role* is examined.

The first student indicates that she has not had any personal experience with the teacher helping her on that issue. She acknowledges not being particularly encouraged to use such techniques, and that if the teacher is asked to help, she will probably provide a summary of the main points learnt the previous year.

"[...] he [the teacher] can for sure repeat the most important we learn last year! I don't know...it was last year, so it is up to us, whether we will further apply them." (8).

Likewise, the second student observes the teacher is almost not engaged at all in studying techniques; the student had corresponding training only in the past years.

"[...] I think we get very little [...] we got a little in youth school, tips on how to learn studying techniques [...]" (12).

She further provides an explanation for this lack of training; she emphasises that the work carried out in drama is chiefly of a practical character. Learning takes place through practice, and thus theoretical training in the sense of book reading is not actual.

"[...] in those [subjects] like in drama, for example, it is very particular, because there are no books that...we have books, but it is not made up in such a way that we must read those books, it is sort of voluntary [...]" (14).

Accordingly, the help the teacher provides is directed to the practically executed assignments; it consists of comments on the students performance.

"[...] So it is the work we do, for example to learn acting techniques, to get in the role, and expression on the stage and emanation and so on, we learn them through practical training and when we ask the teacher, we get feedback" (14).

Besides, the student indicates that it is also time restrictions that set limits to the amount of theoretical work carried out; practice is prioritised.

"[...] But we have learnt a little about theoretical things [...] but it is very little, so we rather do it, we don't learn the theory, we just learn it in practice in a way. And it is for sure because of time, that we don't have time to go through the theoretical." (15).

With regard to the teacher's own experience of her role with providing help with studying techniques, a focus on group-work is found. The teacher explains the assignments are carried out under group-work, so the students are expected to be capable of co-operating and solving personal conflicts that might arise. This is what she considers as the main problem the students might need help with. Her contribution is to observe the students' work and express her opinion on the way the work proceeds, or to make suggestions on how to

resolve disagreements and move on.

"[...] The way it is in drama, we work in groups under the exams [...] the teacher goes round and gives actually advice [...] what may happen is that those in the group do not function all together. So it is in a way –I have actually experienced in under the exam... We can do some things, for example give them advice about what they can do to go further [...]" (18).

Summing up, two remarks can be made. Firstly, the participants' experiences with studying techniques are minimal; almost all the weight is put on the practical work, something which directs the kind of training executed by the students and consequently the help provided by teacher.

Secondly, the extant absence of training in studying techniques can be related to the lack of training into critical thinking. It seems that with prioritising practice, the necessity of training into studying techniques is not recognised. For instance, the contribution of knowing how to elaborate various informational sources –and thus examining something under various perspectives- to the execution of a work evaluation, is not obvious to the participants. Studying techniques are viewed one-sided, meaning having only a theoretical value, and hence not directly related to drama education.

Subsequently, the teacher's expectations around critical thinking and its demonstration cannot be totally fulfilled by the students. Work analysis and evaluation requires knowledge on how to handle and investigate information. Once again, the discrepancy in the students' and the teacher's experiences of critical thinking indicates a miscommunication between them. What is essential and necessary for critical thinking demonstration is not shared by both groups.

The next studying direction to be analysed is AA.

Table 4.3. Constituents for AA - students and teachers

Critical thinking

Student (Female)	<ul style="list-style-type: none"> ◆ Examination of information It requires: <ul style="list-style-type: none"> ◆ previous knowledge ◆ favourable milieu ◆ additional information sources 	<ul style="list-style-type: none"> ◆ Identification of causes and consequences of facts ◆ Group-discussion ◆ Participation in main aspects of learning process It depends on: <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the teacher's attitude ◆ the exam type
Student (Male)	<ul style="list-style-type: none"> ◆ Examination of information ◆ Evaluation of instruction It requires: <ul style="list-style-type: none"> ◆ effort ◆ knowledge on the area ◆ interest in the area ◆ inquiring attitude ◆ favourable milieu It might involve: <ul style="list-style-type: none"> ◆ risk taking ◆ negative atmosphere 	<ul style="list-style-type: none"> ◆ Working journal ◆ Group-discussion It depends on: <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the teacher's attitude
Teacher	<ul style="list-style-type: none"> ◆ Autonomous reasoning ◆ Making judgements and contemplating over the process followed It depends on: <ul style="list-style-type: none"> ◆ biological factors 	<ul style="list-style-type: none"> ◆ Execution of debate ◆ Depends on the nature of the subject

Learning Strategies

	STUDENTS	TEACHERS
Student (Female)	<ul style="list-style-type: none"> ◆ Harmonising with the teacher ◆ Underlying 	<ul style="list-style-type: none"> ◆ No advice due to limited time and amount of material to be covered. ◆ Individual help only when asked: main points
Student (Male)	<ul style="list-style-type: none"> ◆ Reading through, important points, additional information. ◆ Has heard about only once ◆ Use of only when aim is to perform well & under important exams 	<ul style="list-style-type: none"> ◆ Only when asked: read through, keep notes
Teacher	<ul style="list-style-type: none"> ◆ Practice in writing styles ◆ Learning arguments by heart 	<ul style="list-style-type: none"> ◆ Give arguments ◆ Biological limitations

As indicated by the *female AA student*, critical thinking is *perceived* as pertaining to the examination of the acquired information; one should not merely receive and accept it without a deeper investigation of its truthfulness and accuracy.

"I think that critical thinking refers a lot to this, not to swallow things without thinking over them in a way [...]" (1).

The student refers to the intellectual analysis of the fact and information given at school, meaning what is conveyed both in the textbooks and by the teacher.

"[...] when you learn something, like at school (1) [...] not to stand there and accept that the teachers and the textbook have the absolute

answer on everything [...]" (3).

In other words, she advocates that the students should have a suspicious attitude toward what the textbooks and the teachers present and stand for. The grounds for such a scepticism lies in the fact that those informational sources might either present only selective information, or view information from a certain point of view, which is not necessarily the only one existing. Hence, the picture they attempt to draw and the corresponding opinions they aim to form represent their own beliefs on the subject, which might be prejudiced or strictly personal.

"[...] it is not so that a textbook shows the correct picture, if possible. So we have for example in the book of older history which in a way omits to take up certain things but takes up other things which do not mention anything about certain parts of the history." (2).

Thus, the student emphasises the need of acquiring additional material on the subject under investigation; this material stems either from personal experience and knowledge or from other informational sources. The comparison of this additional material with the initial information given, comprises the intellectual analysis which will enable the students to discover omitted or missing elements, thus evaluate the information's truthfulness and eventually form own judgements and take a standpoint.

"so I think in a way it regards quite simply to take in the information and in a way elaborate, try to combine something with other things you know about the issue [...]" (3).

Hence, attainment of additional material, or in other words personal knowledge on the subject, constitutes a condition for critical thinking to take place.

Furthermore, a favourable milieu is requisite. On the one hand, this refers to the teacher's attitude, which must be characterised by openness and acceptance. The students should be given the opportunity and feel free to express their opinion -even if it is in opposition to the teacher's. The teacher should encourage the students to set the various material under analysis, so that they can justify their standpoints by presenting the grounds on which they were formed.

"[...] it is much more open also from the teacher, that the students judge things critically [...] That they [the students] think more themselves, reason so that they come with reasons to their critique and not just think 'I don't believe that' for example." (8).

The student adds that by demonstrating critical thinking, the students become active participants in their own education, they learn by own contribution and effort. Thus, one also

feels that one has control over one's learning.

"[...] that the teacher opens for the students to do it [think critically]...I think this is actually more important [...] that the students also participate in the learning, that you have more ownership to your learning." (10).

On the other hand, a favourable milieu also refers to the educational setting. Specifically, the learning goal should not be directed in mere knowledge reproduction, as is the case in many subjects at present. The student indicates that as grades play a very important role in one's future --i.e. for one's future employment-- the students set high performance as their principle goal. Hence, their learning and studying efforts are channelled to the reproduction of the knowledge given, in accordance to what a high grade conveys. In that way, critical thinking does not take place, as it is not considered vital for one's performance.

"[...] but also to change the evaluation of learning, the kind of characters, because I believe that very often the characters are not given out of the goal achievement from the curriculum, but out of how much subject knowledge a student can just spit out." (19).

When it comes to the *male AA student*, the perception of critical thinking is twofold.

Firstly -and in agreement with the female student- critical thinking embraces the intellectual examination of the presented information. One should be sceptical to the learning material given, and analyse it in order to discover how legitimate it is, and eventually assume a standpoint toward it.

"[...] perhaps not to accept all you learn as it is! Question what you learn." (1).

This information analysis necessitates certain conditions. First of all, personal effort is necessary; one should attempt to go deeper into the subject's essence, to comprehend its nature and purpose. In other words, personal interest into the subject is required.

"[...] you have to make an effort yourself too, that you have to show insight in the subject before you can be critical to it, you can't just discard it and not learn anything and drop out of the lessons." (4).

In addition to personal interest, personal knowledge about the subject is essential.

"[...] you must have a basis...to express...be against it in a way...you must know something about it." (8).

In other words, additional information on the topic should be obtained. Here various sources are actual, both in a written form (books) and other persons' knowledge. The aim is to

examine the initially given information or topic under this additional material, in order to form a personal opinion about it. Discussion with others is also a part of this procedure, as seen from the following quotation.

"[...] you can read some things and then must, should actually, I believe you should question them, because first you can use the teacher fully so he can answer what you wonder about, after having acquired basic information. And if you find weak points so you must ask about it." (5).

Accordingly, personal interest and knowledge on the subject do not always suffice; an inquiring attitude should also be present. Based on corresponding information, the person should be willing and dare to express any aporia s/he might have on the issue, even if it means coming to opposition with the teacher.

Finally, a favourable milieu is indispensable to the exercise of critical thinking. The teacher should encourage and motivate the students to examine things and express an opinion about them.

"some teachers encourage you to say what you believe." (10).

Secondly, critical thinking includes evaluation of the way the instruction is taking place. The student indicates that the instructional method followed by each teacher should be assessed in relation to whether the person learns from it or not.

"but the way you learn can be critical[...] if you believe that the teacher perhaps has a wrong way to teach and you don't get anything, and feel that you don't benefit from it, then it would be critical." (3).

At this point, the student brings up a negative outcome critical thinking might have; namely identification of the weak points in the instructional method sets the question of whether to take corresponding action -discuss it with the teacher or not. In other words, the product of critical thinking might bring about an unwanted situation, as it leads to discovery of weaknesses and negative sides of an issue. In the present case, the expression of dissatisfaction with the way the teacher carries out the lesson might lead to an open confrontation between the students and the teacher. The student thus suggests that a discussion with the other fellow students takes place before involving the teacher. In that way, the student feels somehow safer about mentioning the problem, as the others in the class are informed about it, and have eventually agreed to discuss the matter.

"[...] so it is a question of whether you shall interrupt and say that 'no, no, it is wrong' [...] but it is also others who are careful and believe that it was totally fine, so one has to take it up with the whole class first or...in the majority the students mention it if the instruction lay-up is totally wrong." (15).

In other words, by engaging into critical thinking the person is involved into some kind of risk taking, as the outcomes of the process might be unwanted or threatening for others.

Likewise, demonstration of critical thinking leads some times to the creation of a negative ambience. The discovery of weak points and their expression to the persons directly involved, might be experienced by the latter as ill-meant opposition. In the present case, if some student expresses his/her dislike with the lesson to the teacher rather often, the latter -together with other students- might perceive this as unnecessary objection and thus as a hindrance to the flow of the lesson.

"[...] it can be easy to be...be critical all the time, it can create a negative atmosphere in the class." (9).

The *teacher* of AA has a rather different view on critical thinking. She advocates that critical thinking comprises of two components; the execution of reasoning and the creation of conjectures.

As far as reasoning is concerned, the teacher explains that going through a thinking process on one's own is an indication of critical thinking.

"[...] to think independently perhaps [...]" (3).

Moreover, critical thinking includes intellectual examination of various personal experiences. The examination's aim is to form corresponding judgements. The person should ponder over this process all over again, i.e. examine analytically how s/he arrived at those personal judgements. Then critical thinking has been practised.

"[...] and to come to conclusions about things you have experienced, things you have thought through and then afterwards think over and reflect over and then you can get critical understanding." (3).

In order for the above intellectual examination to take place, certain conditions need to be satisfied. The teacher supports that biological factors influence whether and to which degree a student is capable of performing this analysis. Specifically, the level of development each student is at, determines the easiness with which the student can acquire new knowledge which is necessary for the aforementioned investigation of various issues and the formation of a personal judgement.

"[...] It is difficult because it has with development, nearly with biological things. Some students have come longer, and some find it easy to learn things about the society, learn to discuss and present arguments for and against, while others have very big problems with it" (10).

Seen together, the students' and the teacher's perception on critical thinking are rather

similar regarding some of its constituents. The students refer to the investigation of the information acquired, and the teacher refers to the examination of experiences.

Nevertheless, the requirements set for the demonstration of critical thinking are radically different. The students bring up factors that can be developed -such as acquirement of new knowledge, personal interest; the teacher sets restrictions of a biological nature, which cannot be interfered with. In other words, the students experience critical thinking as something that can be learnt, whereas the teacher experiences the opposite.

Moving on to the *application* of critical thinking in the classroom, the *female student* refers to three groups of circumstances.

Firstly, critical thinking is demonstrated as the students examine facts and incidents by integrating knowledge from various areas. The aim is to discover the reasons which led to those facts and the results induced. It consists thus in the discovery of why and how things happen, so as to form a more complete understanding.

"[...] I can take Norway's history, for example, why Norway was in a decreasing period around 1500-1600, this in a way can have something to do with Black Death that things happened there and that the population numbers went down, and so to see the relation, clear relation, not just the way the history book points them out, but also to be able to point out other relations here and there." (9).

Secondly, group-discussion is another opportunity where the students exercise critical thinking. Under those, the students present their opinion and hear the others', thus examining an issue from various perspectives. This exchange of ideas eventually allows the creation of personal judgements.

"[...] We have a very oral instructional form in a way, which involves much discussion in the classroom [...] And it means that all can participate much more in a discussion around the subject, and that the people can express their own meanings which can lead to conclusions in the class, not just that the teacher lectures or that we read the textbook." (11).

Finally, the expression of personal opinions which is part of critical thinking takes place in a more holistic way, as the students are given the chance to participate in certain phases of the learning process, constantly, and in all the school subjects. Specifically, the students contribute with own ideas, suggestions and decisions about the planning and execution of various school projects, where they are also expected to reflect over and examine the results produced.

"But I think that [my] school is a school which is very good in involving students in the whole of the process. This is also shown through all the small projects we have, all the time and in all possible

subjects, where the students themselves shall see, think, plan and execute and then see all over again [...]" (13).

In addition, the female student feels that the application of critical thinking is not totally independent of certain conditions.

Firstly, the nature of the school subject determines the possibility of critical thinking application. Specifically, in those subjects that are directed toward learning something totally new, demonstration of critical thinking is not possible. This is due a) to the lack of previous corresponding knowledge which is requisite to the examination of the information given and b) to the character of some subjects, which call for strict application of pre-determined rules, that cannot be questioned or challenged.

"[...] It is a little difficult actually [...] you are there and you learn a totally new language, and this is something you don't know about at all from before, and thus it is very difficult to be critical in relation to language. (4) [...] if you are totally new in a language subject, and in a way will learn the language at a totally elementary level, than I think you are not occupied with so much critical thinking because you are dependent on what, you just have to understand and manage to talk and it is something that the teacher can teach you. Regarding those realistic subjects, such as mathematics, you simply have to accept certain things [...]" (5).

In contrast, in those subjects that consist of theoretical constructions, display of critical thinking is possible, as one can use the extant knowledge and perform an evaluation of those constructions.

"[...] when it comes to some types of socialistic or sociological and life-subjects, so you can be critical in the sense that these here are subjects or issues that are built very much on theories that various people have presented, and thus you can be much more individually critical in that you can yourself reason and be critical in that way." (6).

Secondly, the teacher's attitude decides whether the students have the opportunity to demonstrate critical thinking. In those subjects where the teachers give emphasis to mere reproduction of knowledge, the opportunity to employ critical thinking is absent. However, the students have the chance to apply critical thinking within those subjects where the teachers put weight on intellectual examination and evaluation of the given information, as well as justification of one's opinion.

"[...] We have for example a teacher who in a way mostly gives points, plus points for this kind of pure factual information from the book, and it is too silly I think because anyone can dig out facts without thinking twice! [...] (7) But for example when it comes to societal subjects and old history, there it is much more open from the teacher's side, that the students should judge things critically or...that they at least reason [...] that they think more themselves, reason and

so that they present the reason for their critique and not just think 'I don't believe that' for example." (8).

The final factor the application of critical thinking depends on is the exam type. Specifically, there are some types of exams that ask for production of written assignments; those require from the students to choose the subject, form their own ideas and develop them through discussion with others. In that case, demonstration of critical thinking is possible, as investigation of information under exchange of ideas takes place.

"[...] we can choose assignment, and then we have production of ideas, open, and then at 09.15 for example, it shall be quite in the classroom. But you can for example take with people in the corridor and talk with and get feedback and ask them to read through, so you can in a way develop your own work and get the others' opinion. [...] I think it is very positive that you are allowed to do so under this writing exam day at least." (14).

Hence, three factors influence whether examination of information will take place; the subject's nature, the teacher's attitude and the type of the exams.

The *male student* mentions two cases under which critical thinking is applied.

The first one refers to certain situations where evaluation takes place. Specifically, the students keep a working report, in which they evaluate their own work, the teacher and the classroom ambience. This is a process which takes place rather frequently and addresses the whole of the school year.

"[...] we often write a log, or when we had projects and such, we write log about how it went and what we thought –good, bad- [...] then we shall write what we think has been good or bad during all the school year [...] To evaluate, how it has been with the class milieu, what the teacher has done, what you have done" (6).

The second case regards situations where information analysis takes place, meaning subjects where group-discussions are involved. There the students have the opportunity to express their ideas and present their standpoints on an issue, and thus examine the information from different points of view.

"[...] in subjects where you can discuss, then it is easy to be critical [...] about historical events or...perhaps the teacher takes a standpoint, political standpoint which you might disagree with, and then there will often be discussion.[...]" (14).

Furthermore, the male student identifies some conditions that need to be satisfied in order for critical thinking to be applied.

Firstly, the school subject should be of a non-pragmatic nature. 'Pragmatic' here refers to subjects where one has to follow clear, pre-established rules. The student argues that in

such cases critical thinking cannot be demonstrated, as those rules are indisputable and thus the students cannot offer an opinion. In other words, those subjects leave no room for discussion and examination of the presented information. Their aim is to manage to fulfil demands of a technical character, like for example to execute correctly a grammatical rule.

"[...] the teacher shall teach something to the students, it is either language grammar or...and then the teacher follows [...] will just make sure that the rules for how an English sentence shall be written are followed (11) then I find it actually difficult to be critical, if you shall have present -s in the third person." (13).

The second condition for the application of critical thinking is that the teacher's attitude should be auspicious. Specifically, the teacher should be both open to discuss and motivate students to express their opinion in the class.

"and some teachers encourage you to say what you believe." (10).

Hence, whether the examination of the information and the evaluation of the instruction takes place or not, depends on two conditions; the nature of the subject and the teacher's attitude.

The *teacher* of AA identifies the execution of debates as the means to apply critical thinking in the class. She refers to debates of both an oral and written form, both during the lessons and under the exams. There the students have the opportunity to examine an issue from various perspectives, usually in co-operation with others.

"[...] it has to do with what kind of written assignments they turn in [...] and then we come to discussion assignments [...] (5) [...] We discuss for example certain issues [...] some times I use to divide the class in groups and so we can sit, and if you get a standpoint, so can two and two be for a standpoint and two can be against. And so you can sit and discuss for and against." (7).

Moreover, the teacher supports that the application of critical thinking is dependent on the nature of the school subject.

"[...] It has with various subjects to do, it has more with the Norwegian subject than with the French one to do, if I think about subjects" (4).

A further analysis of what the teacher means with the above is unfortunately difficult to be done, as she does not illustrate this standpoint further. Nevertheless, according to what follows after, and to the general gestalt of her experience, it can be assumed that the teacher refers to the opportunities the subjects provide to the students to discuss the information presented from various sides. As she says while differentiating between the Norwegian and

the French subject,

"[it] has to do with what kind of written assignments they turn in [...]and so eventually we come to debate assignments [...]" (5).

As indicated above, the subject of French does not allow any type of discussion and analysis of the information given, as one has to follow pre-established grammatical and syntactical rules. In such subjects, application of critical thinking is not possible.

If we now examine the experiences of the three AA participants together, we notice that the way critical thinking is applied is similar when the perception of critical thinking is similar. All the participants refer to group-discussions, for instance, as they all identify analysis of the presented information as belonging to critical thinking. At the same time, both students mention additional class situations, as they also refer to other aspects of critical thinking.

Parallely, by mentioning group-work, the participants acknowledge the involvement of the *other* in the application of critical thinking. Co-operation is necessary, so as to have a source of information, as well as certain feedback regarding one's judgements. The other offers a different perspective from oneself, and at the same time evaluates the perspective I have, thus facilitating further development and elaboration.

However, a deeper investigation is essential at this point. Even though both students and the teacher mention group-discussions as a means to analyse and examine information, there however a crucial point of difference in how the participants experience the content of those discussions.

The students, in particular, refer to group-discussions as a time when they can exchange ideas, present their standpoints, listen to the others, compare and examine the information presented. They experience them as situations when they can participate actively in the production of own conclusions. In other words, the students' presentation of the process taking place during a group-discussion is indicative of actual application of critical thinking, according to the students' own experience.

The teacher, in contrast, experiences group-discussions as a place where the students train into presenting both sides of a given issue. She specifically suggests that the capacity of identifying positive and negative features of an issue should have been already present, at the time when the students start executing debate assignments.

"[...] so eventually we come to debate assignments, but it is in a way the last step because you must have arguments for and against an issue, and must be able to debate." (5).

Thus, those who are not able to come with own reasons and justifications for a certain standpoint, have the opportunity to actually learn them by heart by being present in a group-discussion and listening to the others.

"[...] We discuss, for example, certain issues, and then those students who are not so good can get arguments from others.[...]" (7).

In other words, what the teacher experiences as critical thinking, i.e. the execution of independent analysis and reflection, does not actually take place during what she presents as application of critical thinking. The students instead of receiving training into how to produce own judgements and conclusions, are rather trained into memorising ready-made statements from others.

As a kind of clarification to the above discrepancy, the difficulty the teacher feels in explaining what critical thinking is should be mentioned at this point.

"[...] That was a difficult question [...] I think this is difficult to answer[...]" (1).

In other words, the experienced complex nature of critical thinking can be eliciting the aforementioned discrepancy between the teacher's experiences regarding the perception and application of critical thinking.

Interestingly, all participants indicate that the application of critical thinking depends on certain factors; they all mention the importance of the nature of the school subject, as it dictates the possibility of demonstrating critical thinking or not.

However, such a restriction posed from the teacher's side, implies a restriction to the amount of activity and responsibility the students can assume. When a subject is considered impossible to discuss and study by own contribution and analysis, then the teacher and the textbook automatically becomes the ones possessing all the legitimate knowledge and authority. The participation of the students is limited to the memorisation of rules and formulas.

The above comment will be also made more obvious as we examine the issue of *learning strategies*. Starting with the *students' techniques*, the female student refers to the importance of taking under consideration what the teacher considers as essential when she studies. As mentioned above, school grades are significant to one's further working life; hence, the student tries to give emphasis to the points she believes the teacher is going to assess as positive.

"[...] What happens is that you have to adjust your reading to each one, how you notice that each teacher evaluates you. (20) [...] when I

study history, for example, then I manage to read the book and then I manage to underline the important parts out of what I know my teacher is going to judge as important [...]" (22).

As seen also from the above excerpt, the student uses underlying as a more specific method to study.

When it comes to the male student, he uses first to acquire a general impression of the learning material by reading thorough the whole, and then examines certain parts in detail by keeping notes of them.

"[...] you can start by reading what you are supposed to read, and read it, you can try to note what you believe is important of what you have read [...]" (16).

He additionally indicates that when he wishes to work with the learning material in a deeper way, he acquires corresponding information from other sources so that he can have a broader or different perspective on the issue. He suggests that providing various views on a issue in a way that shows previous examination and elaboration gives a higher grade.

"[...] and if you really shall work with it, then you shall of course go to other sources than the textbook and the pages you have been given to read, as then you get another view on the things, students have different views. Because when you have some more sources, then you can reflect and present various angles of an issue and then a test or an answer will be immediately more complete in a way." (16).

The teacher indicates that the students should train into how to debate, meaning with providing for and against arguments on an issue. As mentioned above, this can be achieved by acquiring extant arguments from others, meaning either from fellow students under group-discussions or from other informational sources.

"[...] the debate assignments are often directed toward societal matters, they concern society, a little politics, for example arguments for and against gender equality, and then the students must firstly follow the media, take arguments from the media [...]" (9).

The teacher acknowledges that she does not actually train the students into how to discover their own arguments and come to own suggestions and ideas. She explains this by referring to external factors; the vast amount of learning material the students have to go through in the limited school time. She suggests that the students should thus train outside the school frames, either by engaging into discussions with friends or by acquiring information from various sources.

"[...] it is very important because, perhaps, I don't know how much they discuss between them, because at school I don't engage so much into training them into finding arguments...because at the Norwegian

subject there are so many different kinds of genres they shall be trained into, so that they should perhaps do it on their own as well, and train themselves, to read the media, listen to the news." (9).

Given the above limitations, the teacher also suggests that the students train into all the nuances of the subject the lessons include, so that they are prepared in every case. In other words, selective training based on what one is good at, is not effective.

"[...] one thing that is very important for me is that all of them, all the students must have tried themselves in all the genres which we go through. Because that the students very easily choose the genre they can take good characters for [...]" (12).

Again, the teacher emphasises that learning depends on the development level of the students, so that not everyone is capable of examining an issue from various perspectives. She thus indicates that those students should choose assignments of a different character, so that they have a chance to perform well. In other words, the teacher feels that not all the students can learn how to come with own arguments, and the solution for them is to totally avoid dealing with such tasks.

"[...] Some students have come further, and some students can easily learn things about the society, learn to discuss and provide arguments for and against, while others have very big problems with that. (10) [...] but fortunately, there are more assignments than debate assignments and argumentation assignments in a way, we can take literature analysis." (11).

Returning to the aforementioned issue of the extent to which critical thinking is applied in the class, it is suggested that the teacher's posing of limitations to the studying techniques the students can follow, also limits the possibilities of demonstrating critical thinking in some subjects. As the teacher indicates that the best technique for certain students is to memorise others' thinking products –due to developmental reasons and time limitations– training in critical thinking does not actually receive place.

Accordingly, the female student's harmonisation with the teacher's conception of what is essential in the learning material supports the assertion that students do not receive particular training into how to think autonomously and come to own judgements. When asked specifically by the researcher whether the teacher shows them how to execute critical thinking, the student answers negatively (see meaning unit 12).

Agreeably, the male student refers to the elaboration of the learning material under the light of additional information, but only when 'one really wants to work with it'. He specifically explains that he does not usually make use of the studying techniques mentioned,

only when he wants to receive high grades. Even then, it is not a systematic elaboration, but rather a last minute effort.

"Yes, when the tests are important...or when I feel that here I must do well, so I sit down...it will be possibly late, a night before" (20).

This lack of specific training techniques related to critical thinking is also demonstrated when examining the teacher's role on the matter.

The female student indicates she receives no particular corresponding training at present, as the teachers are forced to cover large amounts of learning material within short time limits. Emphasis is hence paid on the amount of the material learnt and not on how it is learnt.

"[...] We had a person who came in during the first classes...studying techniques, it was the foundation course in studying techniques [...] but I think it is that the press which is put on the teachers to go through the subject syllabus but not only that...I think a lot of teachers think they have to go through the specific textbook, which they have chosen to the subject plan. And thus there will be left so little time that they do not reach it in a way to help every specific person with techniques to achieve in a way to acquire knowledge, I think it will be difficult." (29).

However, the student explains that if the teacher is asked individually, then she provides advice on specific problems faced.

"[...] If you go yourself and ask the teacher for help, I think you will absolutely get help, for example with how you can read and such. Because then the teacher can in away judge you as a person and not the class as a whole, so if you say I have problems with this and that, I have problems with isolating main points for example, how, what shall I do, how do you think I can do it, then I think the teacher can absolutely help you much more [...]" (30).

The male student provides a similar explanation; he received training in studying techniques mainly in the past, regarding how to deal with the learning material in a systematic way.

"[...] We had a teacher who taught us studying techniques. [...] Taught us how we shall make a...we read, first we shall go through the material once quickly, then we make thinking cards with circling of, use of sketches and so on. Tips about to collect more informational sources, this we received from the society learning subject. (17) [...] it was one person, a teacher who went to all the classes." (18).

In addition, he indicates that when asked individually, the teacher advises the students on how to go through the material.

"[...] Yes, he can of course help you. Most of them can, we have some about general studying techniques, that you shall read a lot of times,

and take notes." (19).

The teacher on the other hand, indicates that the help she can provide is limited due to biologically determined factors. Students that have not come so far in the development and face difficulties with performing an intellectual elaboration, cannot be helped in an effective way.

"It is difficult because it has with development, nearly with biological things. Some students have come longer, and some find it easy to learn things about the society, learn to discuss and present arguments for and against, while others have very big problems with it." (10).

Hence, the teacher's role is directed to helping the students with finding arguments for and against an issue when they run out of ideas and cannot continue the discussion-groups. The actual content of the teacher's advice is not quite clear, but taking under consideration what has been presented above, it is indicated that her help is limited into providing ready-made arguments.

"[...] Often it stops in some groups, very many groups, and so they do not manage to argue, they can have only one or two arguments and then they say 'stop'. I use to go around and help them a bit on the way, but it is very often that they stop." (8).

Summing up, it is indicated that the teacher's perception and beliefs about critical thinking and its application in the class, have a very strong influence on the students' experiences. As the teacher faces difficulties into completely comprehending critical thinking, and thus feels helpless in assisting the students who are developmentally behind in learning, she does not promote specific training in learning strategies that could enhance critical thinking. The students in turn, experience an absence of the possibility to demonstrate critical thinking -during language subjects for example- as well as a lack of analogous training into learning strategies. One of the factors they identify as determining critical thinking application -the teacher's attitude- seems thus to be active in that case.

After having presented the participants' experiences from each studying direction separately, students and teachers will be seen together so as to sketch a more general portrayal.

With regard to the *students*, the following are observed:

- The experiences are situated; the meaning critical thinking conveys is in close relation to the context of the experience. Critical thinking is not an abstract concept, but takes form according to the subject's nature; meaning whether the subject is of a practical or a theoretical character.

Specifically, all the students refer to the examination of information and evaluation, but their descriptions have a different nuance. The AA experiences are located at a more theoretical level, where emphasis is given on the investigation of the material presented in the textbooks, by use of additional informational sources. The students deal principally with objects of an abstract nature, unreal entities such as historical facts, ideas and theoretical constructions. They must execute an examination at a pure theoretical level. The same concerns the evaluation of their work, which is done according to given standards and rules, which again refer to immaterial articles.

FO and DD are of a more practical orientation; the evaluation of the work and working process is done based on and with the use of a physical object, e.g. a drawing. Here theory is related to praxis, the connection between the two is of a high significance. The investigation of the material presented occurs within the sphere of the 'real'. The students have a physical item on which they 'see' the application of theory and hence evaluate it as such. Their main concern is to discover solutions to given assignments and execute them in practice. They work with their body in relation to the mind. FO students use various material and tools so as to construct an item, whereas DD students use their body movements, voice and facial expressions in order to perform a play.

Furthermore, as the nature of their work involves praxis, the criteria with which they carry out an evaluation are formed accordingly. Both DD and FO students use their physical senses as well as aesthetical factors; their body gives signals that are considered as indicators for the evaluation carried out. Critical thinking is not only a cerebral activity, it requires participation of both body and mind.

- All students refer to the application of critical thinking as a process taking place in relation to *others*, it is not a sole activity. Examination of the work is done either by comparing one's work to the others, or by discussion, by exchanging opinions and sharing observations in a group-work. Additional informational sources are also employed, meaning that the perspective of the other is present. The self alone does not suffice for the completion of such a process.

- They all set certain conditions that have to be satisfied in order to employ critical thinking. Those include: *personal attributes*, such as attitude, effort, interest; factors that can be *learnt*, such as knowledge and experience, or *external factors*, such as favourable milieu, teacher's attitude, subject's nature.

Interestingly, only the students of AA refer to the significance of the subject's character, namely whether it allows examination of information. The students of practical

subjects do not acknowledge anything similar, as the nature of their work encompasses the application of critical thinking. It seems that in practical subjects, critical thinking is inclined to be employed.

- Application of critical thinking has certain consequences for oneself. Those could be positive, like enhanced self-awareness regarding one's knowledge and actions, or negative, for example one-sided focus.

- Finally, as it is also shown by the investigation of learning strategies, the students receive almost no training on those techniques that enable demonstration of critical thinking, and subsequently no training with critical thinking itself. The reasons given by the students refer mainly to the teacher's attitude or to the subject's nature that does not give space for such training.

Similar observations can be made about the teachers:

- The perception and application of critical thinking is closely related to the subject's nature; the meaning it conveys for the teachers is context-dependent.

Specifically, the teacher of FO and DD describe critical thinking in similar ways; it comprises of work analysis and evaluation. Their subject is of a practical nature, and this influences how critical thinking is employed. The teachers emphasise this close relation of theory and practice, it is an inseparable part of their subject. In FO, the examination of the working process followed under a drawing is done by involving theoretical knowledge on the rules governing an art creation, in combination with material and tools. Accordingly, the evaluation of such a work piece requires use of for example previously created art items, and physical examination of them. In DD, analysis of a theatrical piece implies a procedure that includes not only reference to theoretical canons, but also use of one's body and physical senses. Likewise, the evaluation of such a work follows criteria of that kind, examination of one's voice, movements, the emotions evoked.

The teacher of AA, however, has a quite different experience of critical thinking, which is in accordance with the theoretical character of her subject. She talks about autonomous reasoning and examination that leads to personal judgements; they both concern theoretical constructions, such as political standpoints, literature pieces. For her, critical thinking is executed at a pure intellectual level, it engages only mental activities.

Besides, in the two practical subjects, the role of the *goals* set is of a great significance, as they guide the execution of the work. Both teachers explain explicitly the different goals the students' productions have to achieve. The process of comparing one's work with the goals is a rather clear one, as the nature of the subject allows for a physical almost examination.

This is not the case with AA, where the theoretical character of the subject and the examination carried out do not evoke such an emphasis on the goals; the elaboration of the students' work does not involve easily defined processes, due to the work's nature.

- The teachers of all directions acknowledge the significance of the *other* in the application of critical thinking. For FO and DD, evaluation of the work is actually a co-evaluation, where the others' work is a reference point. Analysis and assessment takes place under discussion and elaboration of own ideas via comparison to the others'. Likewise, in AA, debates are carried between the students, where arguments are exchanged, and standpoints are viewed from different perspectives.

- Critical thinking depends on certain factors. Knowledge and experience is present at all the teachers' descriptions -naturally of a different kind. Whereas FO and DD refer to such factors that can be *learnt*, the teacher of AA also refers to *uncontrollable* biological factors, such as level of development and intellectual ability. The reference to the role the subject's nature plays, is made here only by the AA teacher. This reinforces the analogous observation made above, that the practical subjects enable the application of critical thinking.

- The application of critical thinking elicits positive effects, like increment in comprehension and self-insight.

- Finally, according to the type of factors that the teachers believe determine the demonstration of critical thinking, training into relevant learning strategies takes place or not. FO and DD, specifically, mention various ways the students can practice with how to carry out critical thinking, as the required knowledge and experience is a matter of learning. AA, in contrast, acknowledges not training the students into something similar, as both biological limitations and restrictions due to time/type of subject constitute the instruction of critical unrealisable.

After the above overview, the *principal* of school 1 is now elaborated. The presentation of her experience is later contrasted to the other participants of School 1.

Table 4.4. Constituents for principal, School 1 - Critical Thinking

PERCEPTION	APPLICATION
<ul style="list-style-type: none"> ◆ Examination of information ◆ Making decisions about working process ◆ Attitude of opposition It requires: <ul style="list-style-type: none"> ◆ coherent knowledge ◆ experience ◆ additional information sources ◆ connections among knowledge ◆ attitude of curiosity/interest 	<ul style="list-style-type: none"> ◆ Group/ project-work ◆ Students' participation in the learning process ◆ Assignments of a practical character It depends on: <ul style="list-style-type: none"> ◆ nature of the subject ◆ goal of exams ◆ teacher's attitude

It should be primarily remarked that the principal's experience of learning strategies is organised in a slightly different way. This reflects the way the corresponding questions were posed, meaning by taking under consideration the role of the principal in the school; it is of a more general character compared to the other participants. Specifically, the learning strategy description given is divided into *time*, meaning at what point in the students' schooling such instruction takes place, *content*, meaning what those strategies consist of, and *value*, meaning how those strategies contribute to the students' education.

It should also be mentioned that at this point of the discussion, only part of the data obtained by the principal is presented. The rest is elaborated on the next part of the discussion, under *school culture*¹⁰⁰.

Starting with the *perception* of critical thinking, the principal indicates three nuances.

Firstly, critical thinking embraces the examination of the information acquired at school -the learning material, in contrast to accepting it as being valid and correct at once.

"[...] more critical to learning than what would be the case when they just passively receive information." (15).

In order to carry out this examination, the students have to elaborate it from different aspects, view it from various perspectives. This requires that the students apply their extant knowledge, in a novel way. The students, in other words, use knowledge acquired in various school-subjects and synthesise it in a way that elucidates the information under scrutiny. The solution of a problem, for example, sometimes requires a synthesis of two different subject areas, a combination of facts that belong to those two areas.

"[...]some new thought relations come into existence regarding this here that makes them more critical to learning" (15) [...]we often see this comparison between mathematics and physics, or mathematics and chemistry[...]it is a lot of sources of error you can consider."(37).

¹⁰⁰ The same concerns the principal from School 2, later on.

This integrated knowledge should also be complemented with information retrieved from everyday experience and additional informational sources. The students use what they see and hear being within an everyday situation and combine it with other theoretical knowledge, either from school classes or from magazines, books, films, and other relevant informational sources.

"[...] this, to find the information on your own [...]" (15).

Specifically, this information examination can have many facets. In the above case, it comprises of examining the truthfulness and correctness of the facts given; the presentation of a historical incident in the textbook, for example, can be contrasted with knowledge acquired from other sources, so as to determine the possible political beliefs hidden behind it. The student can thus determine to what extent what is being said is 'true', and can form an opinion by considering other relevant perspectives.

In addition, the elaboration could be addressing issues having a more direct connection with everyday life, like situations commonly met or beliefs and practices applied nowadays. Critical thinking is here the examination of the issues from various perspectives, by employing different points of view and making own judgements.

"[the students] shall be critical to the society in general and to information, knowledge [...] to discuss, what do you think of this here, what do you think about homosexual priests, is it correct to have homosexual priests in the Norwegian churches [...] to engage the students in a critical thinking around societal debates or around the school subject." (34).

Similarly, this investigation should expand beyond the limits of the classroom, to everyday situations. Critical thinking implies to analyse the situations, convictions and standpoints supported by the media, by commonly spread informational and recreational sources. The students should evaluate what is presented, assess its truthfulness, accuracy and authenticity, meaning being the opposite of passive recipients.

"[...] the students' critical sense to the real world, in relation to what they see on television, for example that play, 'Big Brother', or in way similar soap operas, or 'Hotell Cæsar' or others, so that they manage to understand that this is an unreal world described there [...]" (44).

Another case is that of examining information in relation to everyday situations. This concerns particularly assignments that ask for another type of action, which ostensibly has nothing to do with everyday life. The principal refers here to subjects such as mathematics, where the execution of an assignment signifies use of abstract concepts and ideas. However,

when the elements used in such problems pertain to situations existing in the students' everyday interactions, then the solution takes a different turn. It involves, namely examination of the correctness of the answer obtained by contrasting the problem's elements with a 'real' situation. The degree of agreement with a relevant experience from everyday life should be an indicator of the rightfulness of the answer obtained, together with the control of other factors, e.g. the purely mathematical calculations performed.

"[...] the arithmetical problem was that 100 erasers cost 50 kr, how much does one eraser cost? Then some students have just multiplied the two numbers together, and found that it costs 5000 kr, others have divided 100 by 50, because the numbers were given in that order in the assignments, while others have divided 50 by 100, and have hence found the correct number (39). [...] when one executes such easy problems, then one has to be critical to how one puts the numbers together, and if you answer that one eraser costs 5000 kr, then you should really realise that it is wrong. Then you should at least write that the answer must be wrong, something that some students do sometimes. Without them necessarily knowing why." (40).

In other words, critical thinking in this situation contains the use of one's extant knowledge and everyday experience in the control of the correctness of the actions performed, even if the working area does not have a direct connection to this knowledge. It requires the integration of knowledge stemming from various areas, both school subjects and personal experience, and the acquisition of additional informational sources. It is to go beyond the mere obvious; i.e. not to solve the assignments by considering the external characteristics of the elements given, here the order of the numbers. It involves the examination of the final product in relation to an extant situation, here the examination of whether an eraser in real life can cost 5000 kroner. The student should be in a position to make this analogy with everyday life, and accordingly reject the answer given, based on this emerging inconsistency. For the principal, this realisation does not always have to be accompanied by an explanation of what the student did wrongly. The initial observation of the erroneous answer does not necessarily mean knowledge of the correct path to follow.

A similar case of examining the information obtained is this of considering the various knowledge facts in a holistic manner. The principal specifically refers to an assignment within the science subject. The students are asked to explain a given situation, where certain objects were put in relation to each other. Their properties are known, so the way they would react with each other was predictable, according to the theoretical knowledge given in the textbooks.

"[...] they were supposed to measure a so-called voltage progression row, so I put the metals one after the other, according to how they react with each other, it was gold and silver one the one side, and then

there was magnesium and zinc on the other side – magnesium and zinc react very easily" (42).

An additional item is added to the above situation; the results obtained are totally unexpected in relation to the theory regarding the agencies of the items. The students are thus to explain the reason for encountering this unanticipated situation.

"[...] then it is so that aluminium, it will not, it does not fit in. Then the students were to answer why, why it is so that aluminium, when we measure the voltage that goes through those metals here, [...] then aluminium does not end up correctly in relation to what the textbooks say. Then they have to find an explanation on it. Why you get such sources of error." (43).

In other words, the students are to examine the situation not only by looking at each object's characteristics independently, but by elaborating them together, by synthesising the information provided in a new way. In order to discover the unexpected behaviour of aluminium, its characteristics should be analysed in relation to the others, as they might be influenced by the properties of the other metals.

It is implied at the same time that the students are enabled to solve the assignment by actually handling the objects involved. The principal gave the problem to the students by using real metals which the students could touch, move, see directly how they react when put in relation to each other. The assignment has a very physical character, despite its abstract nature, which directs the use of theoretical constructions and rules.

In other words, critical thinking is not a pure cerebral activity; bodily senses are essential in trying out various acts and checking their effect. The students can 'see' the results of theoretical investigations directly, can manipulate the components of the assignments given in a real way.

To sum up, the first nuance of critical thinking refers to the examination of information found either in the textbooks or in everyday situations. The students are called to view it from various perspectives, compare it to own experience, use additional informational sources and come to own judgements regarding its truthfulness. In addition, this examination regards the discovery of inconsistencies in relation to personal experience and common knowledge, and requires also synthesis of knowledge that belongs to various areas. Finally, this is not only a mental activity; the body also contributes.

The second nuance of critical thinking refers to the process of making decisions regarding school praxis. The principal refers to the students' participating in the central aspects of the learning process, meaning its planning, execution and evaluation.

"[...] the student is challenged to work on his/her own, to participate, that he is forced to take part in applying this learning work him/herself" (48).

When the students are given part of the responsibility for learning, in other words, they obtain knowledge on their own, in an active way; that also implies analysis and examination of the learning material, as demonstrated above.

"[...] we have long had in Norway this slogan called 'responsibility for one's own learning' where we wish the students to take over more of this responsibility themselves, that they work with the learning material on their own, that they are not fed the knowledge with the spoon." (48).

Specifically, the principal uses the example of a theatrical play, so as to illustrate the active participation of students in all the phases of the process. The planning refers to the writing of a scenario according to a given theme. The content of the play, in other words, can be produced by the students; they take as a departing point the given main themes running through the play, some central axes. Those are synthesised into a complete piece, with a beginning, development and ending.

"In drama, when they are making a performance, they will practice, the students do a lot themselves, they often write the play themselves, sit down and write a text, they can get a key-word which can be a Christmas ending [...] they can have that as a Christmas exam, to write such a Christmas performance, it can be some key-words perhaps about what can be included, meaninglessness, church holiday, care, so it can be such key-words, and then they write a play themselves" (20).

Moreover, the preparation includes choice or construction of the necessary apparatus, here the costumes and props used. The students have to set the criteria for choosing the appropriate tools, taking under consideration the agencies of the play.

"[...] they make or choose costumes themselves" (20).

Likewise, the students also evaluate the space provided and decide on how to best use it, in that case a church; in other words, they assess the available means and plan on how to use them so as to achieve their goal. Such a preparation also includes co-operation with others, here the priest of the church. They have to come in contact with him, perhaps discuss issues of time and space.

"[...] perhaps write of what will be included, how will they use the church and the church room, and will co-operate with the priest of the Santa church, and present it to other students." (20).

Thus, the execution of the play leads to its evaluation, which is done in connection

with others. It is more of a co-operation, the students offer their critique to each other, and discuss impressions and comments made. They examine the positive and negative points of their production, identify the weak parts, and offer suggestions for improvement.

"Then they get a lot of this here critical thinking, perhaps, how they choose now, evaluate each other afterwards, how was this here, was it successful to do so and so, how could we have done it better." (20).

In other words, critical thinking is employed when the students actively participate in the learning procedure, meaning in the planning, execution and evaluation of a work assignment. They are involved in synthesising information based on a main axis, setting criteria for the choice of tools and actions, evaluating the results and discovering alternatives. This process requires both mental and physical activity. The writing of the play, for example, involves intellectual operations such as identifying main points, using imagination and creativity to write a text. At the same time, the body takes part in making decisions of a different nature, when factors like space availability, costume size and theatrical expression are concerned. In addition, the whole process is carried out under close co-operation with others, it is not a solitary activity.

This active participation of the students enables them to construct knowledge, in contrast to only receiving ready-made knowledge from the teacher. They are enabled to elaborate the information achieved further, to examine it in various ways and develop a standpoint to it.

"[...] that the students participate at a larger degree in the training themselves, both in the planning, the execution and the evaluation. That they do not sit like passive recipients of knowledge from a teacher, that they do not become a tape recorder which shall just reproduce what the teacher has told them, uncritically." (12).

The principal believes that as the students go through such a procedure, they are enabled to become autonomous; they develop those skills and abilities necessary to take corresponding decisions and actions later on, after the completion of their schooling.

"We believe that when the student participates actively himself, he thinks more about how this here will be planned, how it will be executed, and afterwards not only let the teacher evaluate him, but evaluate himself and the group's work. Then we believe that the students will be more critical to the choice of methods, also later." (12).

Besides, the development of personal qualities is promoted, as they are the only source the student can utilise in order to carry out the assignments. The teacher is not present in that sense that s/he dominates the way and type of the decisions taken. The student is 'forced' to

use own means in his/her pursue of collecting necessary information, in finding out previous corresponding work which can contribute to the planning of the work, identifying areas s/he can actively help with, or where s/he needs additional training, and so on.

"We believe that when the student works more by himself, then one can take advantage of the abilities one has, instead of receiving passively information from the teacher." (14).

Critical thinking, in other words, develops and reinforces one's abilities involved in the planning, execution and evaluation of one's working assignments.

In the third nuance of critical thinking, the principal involves the presence of a certain attitude of opposition. She explains that at the time most of the teachers were young, there was a general attitude of being inquisitive and sceptical to the norms and rules of the society. The youth, in other words, were predisposed to question stereotypes, behaviours, information spread by the authorities, societal classes and gender roles; they did not accept any established institute and values without examination.

"I think that many of the teachers who work at the Norwegian school nowadays were young during the 60's and 70's, when the youth was very critical to the way the society is built up. They wish the students to be critical to the society in general, and to information, knowledge. (34) [...] the teachers in the upper secondary school are generally rather critical to the society development, exactly due to their revolutionary background, very many teachers have a critical view of the society." (46).

This attitude is also expressed by taking action against all those established norms and institutions, by not following the common path. With the act of choosing another way of behaving and being, the person declares his/her doubts and disagreement to canons posed by outside forces, be it traditions or political power. This action is a mode for rebelling, for going against the mainstream. As an example here, the principal mentions abdication from the State Church.

"[...] Very many teachers for example have abandoned the Norwegian State Church. They belong rather long on the left side, politically." (46).

To sum up, critical thinking embraces the examination of the information received, the making of decisions regarding the working process and contains an attitude of inquiry regarding society and the established norms, usually followed by corresponding action.

In order for the above to be employed, certain requirements have to be fulfilled.

Firstly, the person needs relevant knowledge and experience within the area the examination is taking place. As hinted also above, critical thinking cannot be demonstrated

when the issues involved are unknown to the person. This emerges from the gestalt of the principal's experience, where the examples and illustrations given always evolve around issues the students are familiar with. The assignments presented comprise of information or situations pertaining to everyday life incidents and objects, that the students have close personal experience with. In that way, they are able to use their extant knowledge so as to elaborate the situation. This can also be shown in a specific part of the principal's description, where she explains how such an assignment can be given in subjects that have a more abstract character, like mathematics.

"[...] but if you make an assignment that takes up something, a problem from the real world, then it is obvious that one has to be critical in relation to the arithmetical piece one makes." (37).

The example presented above uses erasers and their price so as to construct a mathematical problem. This case is a clear demonstration of the necessity of having personal experience and previous knowledge on the issue under scrutiny, in order to demonstrate critical thinking.

This is also made more clear when examining what the principal comments on the employment of critical thinking outside the classroom frames. As mentioned above, she describes critical thinking as the examination of the truthfulness and liability of the information, among others. However, she indicates that the corresponding training students receive at school, does not necessarily guarantee that the students will do the same on issues addressing everyday issues. She refers, for instance, to the information provided and the reality constructed by the media, like television programmes, and the students' ability to evaluate them and identify what is real and what is not.

"[...] critical thinking within the science subjects, at which degree it trains the students' critical sense to the real world, in relation to what they see on television, for example that play, 'Bog Brother', or in way similar soap operas, or 'Hotell Cæsar' or others, so that they manage to understand that this is an unreal world described there, I am a little bit uncertain on that, I believe perhaps that this training in science subject does not make it so that they manage to be critical to things around them in that way, I do not believe that." (44).

The principal, in other words, comments on the transformation aspect of the training in critical thinking carried out at school; she does not believe that training into one area automatically means training in other areas. Considering the whole gestalt of her experience, she implies that the way the school subjects provide knowledge to the students is not in close –or in not at all- connection with everyday life matters, something that hinders the development of a general attitude of examination and scepticism. According to the

presentation above, critical thinking requires experience from everyday life, assignments that are closely related to 'real' incidents and situations. When the various subjects fail to make such a connection, the training in critical thinking will be limited to that school area, and the students will not employ it in other areas.

In addition to personal experience, an attitude of curiosity and interest for one's surroundings is required. The principal underlines that when one is pre-occupied with one's own private situation only, then one is quite indifferent to persons and situations around. In order for an examination of the aforementioned type to be initiated, the person has to show interest in discovering how other people are, what their experiences, beliefs, attitudes and ways of being are. The principal calls this lack of interest selfishness; in other words, being totally absorbed by one's own affairs. This indifference also indicates a lack of care about others, as one prioritises –perhaps even exclusively- the enhancement of one's own situation and does not consider the others' well-being.

"[...] the Norwegian society is very selfish. We live –after my opinion- in a selfish society, where everyone is very occupied with oneself, so selfish way of viewing people. They are not so engaged into how it is going with other people [...]" (47).

The principal also indicates that this selfish attitude is partly due to the people's being rather wealthy. It is thus implied that when one has satisfied one's needs, when one has a certain power to fulfil one's wishes and dreams, then one can be absorbed in this state of well-being at such a degree that one becomes indifferent to the others. Financial wealth gives a certain power and authority, which carries the potential of removing empathy and care feelings for the others. When one is content with one's life situation, one becomes distant from others' problems, and hence loses the interest in exploring the world around. Individualism wins over group spirit, as one loses the contact with others concerning common goals and dreams.

"[...] I think it is partly something that comes into existence together with wealth [...] one becomes very little critical to what goes on around in the society. I absolutely believe that." (47).

Critical thinking, in other words, presupposes an attitude of interest and care about others around, as it leads to the initiation of a corresponding investigation.

Accordingly, the principal illustrates the following circumstances when critical thinking is *applied* at school.

Firstly, the students are assigned project-work which demands a thorough elaboration of information. Satisfactory performance requires from the students to find the appropriate

information, synthesise it, identify relevant and main points, analyse and present it in a coherent way. At the same time, project-work gives the students the opportunity to participate actively in the central aspects of the working process, as it calls for planning, execution and evaluation.

The principal specifies that there is a special school programme where project-work is the usual type of assignment the students carry out.

"[...] So this with project-work, it is a part of the 'Active 2000' project, this that they shall make something, present something, do something during this period here -it can be short projects, they can use one day on them [...]" (15).

In addition, this type of work is present in many of the studying directions, such as drama.

"In drama, when they shall make a performance [...] the students do a lot themselves, they write often the play themselves [...] they make or choose costumes themselves [...] and present it to other students [...] [they] evaluate each other afterwards, how was this here, was it successful to do so and so, how could we have done it better." (20).

Furthermore, the students are usually motivated or they need to carry out school assignments in groups, and are thus asked to co-operate effectively. As seen before, the principal experiences critical thinking as a group process, where the person by exchanging ideas, helping and being helped by others can carry out the required tasks. The previous example from drama work is relevant again here.

In other words, the school provides the students with the opportunity to carry out a type of work that involves critical thinking in the sense of examining information and participating in the working process. Meanwhile, the presence of the other is also ensured by engaging the students into group-work.

Secondly, the students are given the opportunity to elaborate information as the teachers motivate them to engage into corresponding discussions. The teachers provide incentives such as controversial issues and incidents from everyday life, stereotypes and established beliefs and norms. They challenge the students to take position on such matters, and hence exercise analysis and evaluation.

"[...] They [the teachers] will certainly often try to give the students chance to discuss, what do you think of this here, what do you think about homosexual priests, is it correct to have homosexual priests in the Norwegian churches [...] to engage the students in a critical thinking around societal debates or around the school subject. This here with nature protection, environment protection, such things. So I believe the teachers in general give very many arenas to the students where they can discuss, where they can train their critical thinking."

(34).

Parallely, this kind of challenge that the teachers give to the students, can contribute to the development of an attitude of opposition. As the teachers choose provocative and controversial issues for discussion –as the issue of homosexual priests- and by apparently presenting the state or established position and its counterparts, they indirectly train the students into assuming an inquisitive approach when such norms are met. Besides, the principal's description of the teachers as being revolutionary when young, and now eager to turn their students into critical thinkers, supports this assumption.

"[...] They [the teachers] certainly wish the students to be critical to the society in general and to the information, knowledge" (34).

Finally, the teachers also adjust the working assignments so that the students can use their everyday experience and extant knowledge in order to check the solution obtained; in other words, the assignments given are of a more practical nature. In the case of mathematics, for instance, the teachers can use situations and facts from everyday life, so as to transform the abstract character of the subject into a more approachable and accessible one. As seen also above, the use of erasers and their characteristics in a way that pertains to reality, enables the students to identify inconsistencies based on everyday experience.

Similarly, the actual use of objects in order to present and solve an assignment enables the students to employ critical thinking. The aforementioned example taken from the science subject demonstrates this point. The principal provides the students with the actual metals, which they can handle and set in different relations to each other, so as to solve the problem. This very practical nature of the assignment enables the students to employ critical thinking, as they can construct various research situations, test them, and have immediate results which they can use further.

Hence, the principal identifies three ways in which the students are given the opportunity to employ critical thinking; by being assigned project- and group-work, by being motivated to engage into discussions and simultaneously by being trained into developing an attitude of opposition, and by solving assignments of a practical character.

However, the principal indicates that the application of critical thinking also depends on some conditions. Specifically, she refers to three such factors.

Firstly, the nature of the subject determines whether critical thinking can be employed or not. Namely, the subjects that comprise of clear and indisputable rules are not offered for critical thinking application. Their pragmatic character counteracts questioning and

investigation of the information given, or for the expression of own judgements. The principal brings as an example mathematics; it is ruled by pre-determined theorems and canons that cannot be doubted or altered.

"It depends on the subject, because it is obvious that in a subject like mathematics, there is not perhaps such a big opportunity for critical thinking [...] (35) It is because mathematics is a logical subject, we can reduce it to the total basics and say that one plus one is two, it is not possible to have any critical thinking around that" (36).

Another type of subject that critical thinking is difficult to be employed in, is the purely theoretical subjects. As seen above, a requirement of critical thinking is the practical nature of the assignments the students deal with, together with personal corresponding experience. In a theoretical subject, however, the use of situations and problems pertaining to everyday life, that the students might have knowledge about and could approach and solve in a practical way, is not always possible to be done.

The principal contrasts at this point the kind of work carried out at DD and at AA. In the first case the students can produce a theatrical performance, which involves very much practical work, as seen above. The students are enabled to participate actively in all the phases of the work, and thus employ critical thinking. In AA, however, the nature of the assignments do not provide with such an opportunity. They are usually limited to purely theoretical analyses –of for example style and messages conveyed in a literature piece- something that does not allow full participation in the planning, execution and evaluation of one's work.

"[...] at DD, FO, one has a more practical training (19) In drama, when they shall make a performance [...] the students do a lot themselves [...] (20) [...] In AA, there is the typical division in subjects, one has Norwegian, English, mathematics, science subject, economy, handling of information, and it is not so easy to make practical assignments in relation to those subjects." (21).

A way to overcome the above counterproductive to critical thinking situations, is to construct assignments that refer to real life situations, so as to give them a more practical character. We have already seen the example of the use of erasers in mathematics, or the use of metals in the science subject. The principal also refers to subjects like literature, where some teachers apply the same technique as drama, namely the students construct and perform the plays they learn about in theory, naturally at a smaller scale.

"[...] but if you make an assignment that takes up something, a problem from the real world, then it is obvious that one has to be critical in relation to the arithmetical piece one makes. (37) [...] Some teachers do it with Ibsen, if they are going through Ibsen, they make, they perform part of a play, they use some time on it." (21).

Nevertheless, other parallel factors hinder the use of practical assignments in the theoretical subjects. Namely, they usually comprise of a large volume of learning material that the students are obliged to cover during the school year. They are divided into many sub-areas, which the students have to examine in detail. Time limits, hence, direct the way the lesson is carried out; in this case, more traditional lecturing from the teacher and less student activities.

"[...] we must have some lectures and especially in AA studying direction, I believe it is absolutely necessary in some subjects to have what the curriculum has (14) [...] there are so many goals, so many elements in the curriculum for AA, that you cannot spend very much time on going through each individual goal. You must have more lectures if the students are supposed to hear about the various things that are included in the curriculum." (22).

The principal contrasts here the type of work carried out in 'media'. The students, for instance, are responsible of constructing a newspaper page, where they have plenty of time to execute all the steps need to be taken, such as internet research, design and drawing. In such subjects the time limits are much more flexible, and thus allow the students to carry out practical work.

"[...] in media knowledge, we know that the students get as a usual assignment to make a front page for 'Dagbladet', they get to put things on the net, get some texts and so on, which they will use to make a good front page, what they believe is a good front page. For this they can use one month, a five-hour subject, four weeks (23) You cannot do like this in subjects like Norwegian or science, because then you do not manage to go through the various points that are in the curriculum, then it would be too much the students have not worked with." (24).

The importance of the amount of knowledge to be covered is also shown when the principal suggests corresponding changes that can improve the learning situation. Specifically, the principal discusses the benefits of altering the subject syllabuses, so that the main aim would be not to cover as many things as possible, from as many subject areas as possible, but rather to deepen in a more narrow range of topics. In that way, the students would not feel the pressure to learn about and memorise large amounts of facts, but they would have the time to examine more closely a limited area.

"[...] the syllabuses should be re-written, we should abandon the idea that the students in the Norwegian school should know something about everything. Because this is how it is, one starts –not with the ancient Greece, but with old Egypt, the culture in Mesopotamia and Babylon, and so one gets to know all the old history, until the present time. In the science subject, one learns almost about everything, but only a small part, it is quite superficial. I believe that we should go away from that, that the students should know something about everything. To actually reduce what they will go through, and work

more thoroughly with certain themes. The same way it occurs in rather a lot of the occupational subjects." (25).

In other words, the exam goals have a lot to say. The principal explains the students of AA are expected to have examined thoroughly various arenas within a subject.

"The exam press is something, the exam will often test such detailed knowledge in a number of areas." (22).

Moreover, the type of knowledge the exams examine influences the type of learning taking place. The principal mentions that some of the exam assignments require pure reproduction of the learning material, meaning repetition of what the textbook includes. A further elaboration of this material is not the object of the exams, and thus lacks also from the students' training. Knowing things by heart demands time to go through all the material, as well as to memorise and repeat it many times. This does not permit either the will or the time to investigate things a bit deeper. This is clearly demonstrated when the principal suggests a different exam model.

"[...] we should actually reduce, change, or remove the exams. [...] It counteracts a lot of the work here, that we can use more time to make students critical to their own thinking. It will be very much reproduction of knowledge [...] So that I do not pose questions where the students can copy from the book, then they will get more reasoning and that which resembles more this here [critical thinking] (26) [...] The exams influence school by learning by rote knowledge. So the students reproduce many facts and at a very small degree use them themselves." (27).

The learning demands, thus, decide the way learning can be achieved. Exam results decide the students' further progression into the educational system, and future working life. The students are thus forced to harmonise their student activities to those demands, if they want to achieve high results that will enable them to move further.

In addition to the above, the teacher's attitude influences the demonstration of critical thinking. As seen also previously, those teachers that have themselves been inquisitive and sceptical regarding established norms, are more inclined to motivate and provide the opportunity to the students to engage in corresponding discussions.

"I think that many of the teachers who work at the Norwegian school nowadays were young during the 60's and 70's, when the youth was very critical to the way the society is built up. They certainly wish the students to be critical to the society in general, and to information, knowledge." (34).

Likewise, the teacher should also be willing to adopt the new way of carrying out the lesson, in accordance with the new demands. Active student participation requires the teacher to adopt a new role, that of a guide; the students' need the teacher's guidance in executing all

the phases of the learning process. This in praxis means the teacher has to abandon the traditional role, the role of authority and of being the only source of knowledge, and become a co-worker in the students' quest for knowledge. If the teacher is not open to that, or does not have the necessary qualifications for that, problems in allowing student participation arise. Thus, the demonstration of critical thinking in that sense, is not taking place. The principal brings as an example co-operation problems they face with the first year of AA, where the teachers are not used to working in that particular way, but rather view their subject as being independent from the others.

"[...] we have some problems with applying this in praxis, in the first year of AA there are many problems related to this work here [interdisciplinary, student participation] [...] Because the teachers often think that this here is difficult, it demands a lot of work, demands much preparation in order to work together with others, etc. It can be new things." (18).

To sum up, the principal indicates that application of critical thinking requires subjects that allow the execution of practical assignments, which in turn means favourable learning goals which allow the time necessary. Moreover, the teacher has to inspire and motivate the students to engage into such processes, and must be willing to adopt to the new situation, to assume the new role.

Finally, the principal indicates that it is not possible for the teachers to actually check the employment of critical thinking. Their role is to provide with corresponding opportunities and motives, but it is up to the individual student whether s/he will respond to the challenge and demonstrate critical thinking.

"I don't believe that the teachers can secure that [that the students develop or apply critical thinking], but they can motivate and train the critical sense." (45).

Having presented the principal's experience of critical thinking, a comparison of it to the teacher and students of school 1 follows.

Table 4.5. Constituents for all participants, School 1 - Critical thinking

PERCEPTION		APPLICATION
Principal	<ul style="list-style-type: none"> ◆ Intellectual examination of information ◆ Making decisions about working process ◆ Attitude of opposition It requires: <ul style="list-style-type: none"> ◆ relevant knowledge and experience ◆ additional information sources ◆ connections among knowledge areas ◆ attitude of curiosity/interest 	<ul style="list-style-type: none"> ◆ Group/ project-work ◆ Participation in the learning process ◆ Assignments of a practical character It depends on: <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the exam goal ◆ the teacher's attitude
Student FO (F)	<ul style="list-style-type: none"> ◆ Examination of a work piece ◆ Evaluation of one's work 	<ul style="list-style-type: none"> ◆ Independent work with evaluating work pieces ◆ Making decisions about work matters
Student FO (M)	<ul style="list-style-type: none"> ◆ Examination of learning object ◆ Being aware of the central aspects of the working process It requires: <ul style="list-style-type: none"> ◆ previous knowledge ◆ working rules 	Presentation of one's work
Teacher FO	<ul style="list-style-type: none"> ◆ Theoretical explanation of the practical work ◆ Evaluation of work based on pre-determined criteria & the others' work It requires: <ul style="list-style-type: none"> ◆ knowledge of the central aspects of the working tools It is enabled by the physical proximity in the class	<ul style="list-style-type: none"> ◆ Under 3 types of assessment; criteria: students choose, are given, none specific ◆ Occurs constantly
Student DD (F)	<ul style="list-style-type: none"> ◆ Examination of information ◆ Evaluation of the work Prepares for criticism (evaluation)	<ul style="list-style-type: none"> ◆ Express one's opinion ◆ Suggest work alternatives
Student DD (F)	<ul style="list-style-type: none"> ◆ Examination of information ◆ Examination of the working process It requires: <ul style="list-style-type: none"> ◆ favourable milieu 	<ul style="list-style-type: none"> ◆ Evaluation of one's work
Teacher DD	<ul style="list-style-type: none"> ◆ Analysis of work ◆ Evaluation of work based on objective & subjective standards It requires: <ul style="list-style-type: none"> ◆ experience 	<ul style="list-style-type: none"> ◆ Due to the nature of the subject ◆ Work journals ◆ Observation & participation in work
Student AA (F)	<ul style="list-style-type: none"> ◆ Examination of information It requires: <ul style="list-style-type: none"> ◆ previous knowledge ◆ favourable milieu ◆ additional information sources 	<ul style="list-style-type: none"> ◆ Identification of causes and consequences of facts ◆ Group-discussion ◆ Participation in main aspects of learning process It depends on: <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the teacher's attitude ◆ the exam type
Student AA (M)	<ul style="list-style-type: none"> ◆ Examination of information ◆ Evaluation of instruction It requires: <ul style="list-style-type: none"> ◆ effort ◆ knowledge on the area ◆ interest in the area ◆ inquiring attitude ◆ favourable milieu It might involve: <ul style="list-style-type: none"> ◆ risk taking ◆ negative atmosphere 	<ul style="list-style-type: none"> ◆ Working journal ◆ Group-discussion It depends on: <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the teacher's attitude
Teacher AA	<ul style="list-style-type: none"> ◆ Autonomous reasoning ◆ Making judgements and contemplating over the process followed It depends on: <ul style="list-style-type: none"> ◆ biological factors 	<ul style="list-style-type: none"> ◆ Execution of debate ◆ Depends on the nature of the subject

Initially, it should be underlined that the principal has an extensive understanding of critical thinking, which addresses all the subject types. This can be clearly seen when comparing her experiences to all the other participants'. The teachers and students have a more specialised perception of critical thinking, depending on whether their subject is of a theoretical or a practical character, whereas the principal gives descriptions that include all those nuances. Specifically, critical thinking perception refers to examination of information, participation in the working process, evaluation, an inquisitive attitude. Naturally, the principal's descriptions address a more general level, while the other participants analyse them in more detail.

The same picture is found when examining the requirements of critical thinking. There is great similarity between the factors named by the students-teachers and the principal's experience. Those include previous knowledge and personal experience with the issue, an attitude of interest and curiosity.

The only major difference here is with the teacher of AA, who identifies biological factors in the development of critical thinking, whereas the principal does not. Still, the principal acknowledges the problems faced in such theoretical subjects; she describes in a rather detailed way the difficulties those teachers experience with adjusting to their new role. The belief the AA teacher holds regarding the biologically determined abilities, is related to not giving major responsibility to all the students, and thus not allowing them to participate actively in the learning process. The principal is aware of this problem.

The application of critical thinking presents again great resemblance. The principal refers to various circumstances where the students are given the opportunity to demonstrate critical thinking; the other participants refer to those suitable for each subject. Again, the principal's experience includes all cases.

Finally, the factors on which this application depends, are all identified by the principal. She discusses the significance of the teacher's attitude, the nature of the subject, the aim of the exams. She particularly elaborates the hindrances encountered in the theoretical subjects, thus being in agreement with the participants attending analogous courses. She emphasises the necessity of using practical assignments; this belief is justified when examining the situation found in for example FO and DD, where all participants identify more than one ways to apply critical thinking, and most of them by working in praxis. Likewise, the descriptions of the AA participants state those difficulties quite clearly. Time limits and exam demands counteract the application of critical thinking; this is acknowledged by all.

A major difference found is on the requirements for the application of critical thinking identified by the principal and the teachers. The first refers to the importance of the teacher's attitude, of being open, willing and providing incentives to the students. None of the teachers actually refer to their own attitude and actions as being a determinant of critical thinking employment. They rather concentrate on external factors, like the nature of the subject, the classroom's structure, or even in the case of AA, the students' developmental level.

The above imply that the principal has an extensive overview of the factors interacting in the various subjects under the development and application of critical thinking. She seems to have examined thoroughly the situation at school, she is receptive to the teachers' and students' needs and problems faced.

What now remains is the examination of the principal's description on *learning strategies*, and its comparison with the rest of the participants.

Table 4.6. Constituents for principal, School 1 – Learning Strategies

TIME	CONTENT	VALUE
<ul style="list-style-type: none"> ◆ Mainly during 1st year ◆ Repetition in 2nd year ◆ Up to the individual teachers 	<ul style="list-style-type: none"> ◆ General character Directed toward: <ul style="list-style-type: none"> ◆ reading environment ◆ memory enhancement ◆ working conditions 	<ul style="list-style-type: none"> ◆ Help students deal with higher school demands regarding: <ul style="list-style-type: none"> - effort - material

Firstly, the principal explains that the students learn about studying techniques during their first year, at the foundation courses. The training takes place during the whole year, at frequent time periods, and is obligatory.

"[...] we have a separate hour, one hour a week, for all the students that attend the foundation courses, they take up this with studying techniques. Studying techniques are part of the theme that is taken up there, obligatory." (52).

The person in charge of those lessons is the class administrator, the teacher whose responsibility is to see that the students' problems and needs are taken care of. S/he provides help on how to learn in an effective way.

"The class administrator will then go through that with the students or give advice on how one shall learn (52) [...] the class administrator, the leader of the class, uses time to go through all [...] for example studying techniques, says something to the students about how he shall work with the material, to learn it as well as possible." (29).

The students are provided with specially constructed booklets that contain the studying techniques to be learnt.

"[...] there are small, short pamphlets on studying techniques." (53).

Specifically, those techniques are of a general character, meaning they are not connected to any subject in particular. The students are trained into general methods of dealing with the learning material. However, they have the chance to apply them within specific school subjects, as the class administrator most often, takes them up again the following year, in relation to the subject s/he teaches in. S/he demonstrates, in other words, the use of such techniques to the students, and reminds them of what they can make use of, under the elaboration of the learning material. It should be clarified here, that it is up to the individual teacher to include them in his/her lesson.

"It is a general course, and it will be gone through by the class administrator in the other classes, during the autumn when they start. I am relatively convinced that the teachers at the same time take up such memory rules in their courses, often it consists in that the teacher goes through what is most important in the subject, so that the students have something to build upon, remember this and this and this: Napoleon's first, second and third era, so that the students have the most important things. And so that he [the student] can read more himself in order to deepen that knowledge they have got from the teacher or through discussions and work at school." (54).

The principal specifically refers to memorisation techniques, to the identification of main themes functioning as axes for the information to be built around. This, together with repetition of the material, are techniques that regard memory enhancement.

"[...] Where they take up is this with repeating [...] or all the advice about memory techniques, how one can memorise letters and numbers [...]" (53).

In addition, the students learn about other methods which address the reading environment and working conditions. They are given advice on how to better preserve their concentration and avoid tiredness, which aspects of the surroundings they should pay attention to and take care of, so as to take advantage of their studying potential in an utmost way.

"[...] how one can work, in short periods, to take breaks and that one must have good working circumstances, and that perhaps one should be quiet" (53).

Finally, the principal indicates that the value of studying techniques concerns the students' capacity to answer to the school demands. She particularly emphasises the differences existing between upper secondary education and the previous years, in relation to the amount and content of the learning material, which in turns means higher amounts of effort from the student, at higher rhythms.

"[...] When the students come to the upper secondary school, because

it will often be a bit different from the lower secondary school, you have more...the speed will be bigger, going through the subject, and the demands to knowledge will be bigger." (55).

The principal's description is now compared to the students' and teachers'.

Table 4.7. Constituents for students, teachers principal, School 1 – Learning Strategies

	TIME	CONTENT	VALUE
Principal	<ul style="list-style-type: none"> ◆ Mainly during 1st year ◆ Repetition in 2nd year. ◆ Up to the individual teachers 	<ul style="list-style-type: none"> ◆ General character. Directed toward: ◆ reading environment ◆ memory enhancement ◆ working conditions 	<ul style="list-style-type: none"> ◆ Help students deal with higher school demands regarding: <ul style="list-style-type: none"> - effort - material
	STUDENTS		TEACHERS
Student FO (F¹⁰¹)	<ul style="list-style-type: none"> ◆ Reading through, notes, key-words in relation to the goal ◆ Heard only once ◆ Rather demanding ◆ Sporadic use 		<ul style="list-style-type: none"> ◆ When asked: points out what to read. ◆ Regards their instruction unnecessary
Student FO (M¹⁰²)	<ul style="list-style-type: none"> ◆ Harmonisation with teacher's expectations & learning goals 		Only when asked: further clarification
Teacher FO	<ul style="list-style-type: none"> ◆ Knowledge of criteria ◆ Consistent work ◆ Practice in communication ◆ Review of previous work 		<ul style="list-style-type: none"> ◆ Explain & analyse goals ◆ Locate the difficulties
Student DD (F)	<ul style="list-style-type: none"> ◆ Estimation of time, read once, notes of: important parts & what she lacks knowledge for ◆ Heard once: isolate main theme, skim, gradually go into details ◆ Sporadic use 		<ul style="list-style-type: none"> ◆ Repetition ◆ No encouragement for use
Student DD (F)	<ul style="list-style-type: none"> ◆ Additional sources, constant work, concentration ◆ No training ◆ Not necessary to use 		<ul style="list-style-type: none"> ◆ No help since their use is not necessary
Teacher DD	<ul style="list-style-type: none"> ◆ Knowledge of evaluative criteria ◆ Pondering over working process ◆ Studying others ◆ Review of previous work 		Advice on group-work
Student AA (F)	<ul style="list-style-type: none"> ◆ Harmonising with the teacher ◆ Underlying 		<ul style="list-style-type: none"> ◆ No advice due to limited time and amount of material to be covered ◆ Individual help only when asked: main points
Student FO (M)	<ul style="list-style-type: none"> ◆ Reading through, important points, additional information. ◆ Has heard about only once ◆ Use of only when aim is to perform well & under important exams 		Only when asked: read through, keep notes
Teacher FO	<ul style="list-style-type: none"> ◆ Practice in writing styles ◆ Learning arguments by heart 		<ul style="list-style-type: none"> ◆ Give arguments ◆ Biological limitations

¹⁰¹ i.e. 'female'

¹⁰² i.e. 'male'

A general observation reveals that the participants refer to the domains outlined by the principal, such as taking notes of main points, acquiring additional information, concentrating and working constantly. The detailed elaboration differs from participant to participant, according to personal preferences and to the type of the work. Naturally, the principal has a more general apprehension.

A main difference detected is the rather big attention paid by students and teachers to the goal of the training. They emphasise the significance of being aware of, understanding clearly, and working toward the subject goals set. In some cases this is interpreted as acting in accordance with the teachers' expectations, in others following the syllabuses. This particular emphasis is perhaps due to the consequence the exam results have for one's educational and professional future. The students find it more important to obtain high grades, indifferent of the actual knowledge obtained, than to elaborate and deepen into the information, when this is not an exam demand.

The principal, however, does not refer to this issue. She concentrates on ways to handle the environment and the material, but does not mention goal consideration as a technique. This could of course be due to the way the research question was posed; it namely referred to the necessity of handling the learning material effectively, in order to achieve a successful learning. The principal might have focused on the learning material per se, without elaborating the 'successful learning'. On the other hand, as the teachers -and particularly the students- are the ones receiving directly the consequences of the exam results, they are more concerned about how to obtain a high performance. They can be more realistic in that sense, and concerned about the practical ways to achieve good results. Accordingly, the principal is perhaps more occupied with how the students can work effectively, so as to learn, develop personal skills and abilities, be educated in the whole sense of the word. The principal, in other words, might have a more idealistic attitude, compared to the other participants' practical concerns.

Moreover, it is shown that the participants do not feel they receive enough -if not at all- training into such techniques. This concerns particularly the students, who indicate that they are expected to possess such knowledge from the previous schooling years, and that very few teachers encourage or instruct them to use learning techniques. A similar situation is found in the teachers' descriptions; in general, the help they describe providing to the students is not training with how to employ techniques on their own, but rather a kind of direct instruction. They indicate for example which are the main parts to read, or arguments to use, rather than helping the students discover them on their own.

This lack of training is also implied in the principal's experience. Even though she supports that the teachers train students into such techniques, the way this training is described raises some questions. As seen above, she specifically says that the teachers point out for example the main points the students should build their knowledge around, they tell the students what they should remember. After this, it is up to the students to look up further information, so as to acquire a broader perspective. This, however, does not necessarily mean training into studying techniques. The students, in other words, do not learn *how* to look for this main themes, *what* to look for and *why*. By following the teacher's suggestions, they are not trained into discovering ways to learn better, methods that are also accommodated to their individual needs and idiosyncrasies. What if, for example, the main points the teacher indicates are not considered as such for all the students? What if someone needs methods to deal with other kind of weaknesses the teacher has not thought of? Perhaps this is why the students feel they do not receive any corresponding training, because following the teacher's instructions does not enable them to handle their learning in an autonomous way. Besides, the principal herself mentions that after the foundation courses, it depends on the individual teacher whether studying techniques will be included in the lesson or not. This is in agreement with the students' perception of having trained into them only in the previous years.

Still, it should be noted here that the leaflets¹⁰³ the principal refers to, include information and suggestions that address autonomous learning, for example ways to deal with the learning material, discover the strong sides of oneself, find out best ways to learn that attend one's personal skills, abilities, and needs, and so on. The fact that the participants do not refer to them in such an extensive way, could either mean that they are not familiar with them, or that the one-year course they had did not suffice. This is characteristically shown in the case of the teacher of AA, who considers there is very little to do, as such training depends on biological factors, the development of the student. This, despite the specific leaflet demonstrating the exact opposite.

Subsequently, what was supported above, that lack of training into techniques is related to lack of training into critical thinking is further reinforced here. As it is also shown from the principal's experience, the students receive plenty of opportunities to demonstrate critical thinking, but do not always know how to take advantage of them. The factors that counteract the application of critical thinking are also present when the training of analogous techniques is concerned. The techniques' necessity is not always acknowledged, as other aspects of one's training are prioritised.

Having presented the participants from School 1, we now move on to the presentation of the participants from School 2.

4.1.1.2. School 2

As mentioned earlier, the students and teachers of School 2 are not divided into separate groups, due to the similarity of the subjects followed.

Table 4.8. Constituents for students and teachers, School 2 - Critical thinking

¹⁰³ See for example E. Grue (1999). *Du kan lære lettere*. PEDPLEX Norsk Skoleinformasjon.

	PERCEPTION	APPLICATION
Student 1 (Male)	<ul style="list-style-type: none"> ◆ Personal utterances on profession ◆ Self-evaluation of work It requires: <ul style="list-style-type: none"> ◆ personal interest It contributes to: <ul style="list-style-type: none"> ◆ personal insight 	<ul style="list-style-type: none"> ◆ Not particularly encouraged ◆ Only in specific situations
Student 2 (Male)	Examination of the consequences of one's studying choice	
Student 3 (Male)	Solving a working problem	Left to work on their own
Student 4 (Male)	Concept unknown	Concept unknown
Student 5 (Male)	Considering the potential hazards at work	Taking action regarding the potential working hazards
Teacher 1	<ul style="list-style-type: none"> ◆ Common understanding ◆ Various working ways, same result ◆ Evaluation of the teaching/learning method ◆ Attitude of scepticism toward the learning material It requires: <ul style="list-style-type: none"> ◆ experience ◆ practice 	<ul style="list-style-type: none"> ◆ Acquisition of experience ◆ Assessment of learning process & methods It is enabled by: <ul style="list-style-type: none"> ◆ the teacher's techniques It developed during the earlier school years
Teacher 2	<ul style="list-style-type: none"> ◆ Correct action based on external criteria It requires: <ul style="list-style-type: none"> ◆ experience 	<ul style="list-style-type: none"> ◆ Evaluation of the working situations It depends on: <ul style="list-style-type: none"> ◆ the presence/not of learning difficulties ◆ teacher's techniques
Teacher 3	<ul style="list-style-type: none"> ◆ Evaluation of the working situation ◆ Choice of correct action It requires: <ul style="list-style-type: none"> ◆ theoretical knowledge ◆ experience ◆ understanding of the factors 	Solve on their own working assignments

Learning strategies

	STUDENTS	TEACHERS
Student 1 (Male)	<ul style="list-style-type: none"> ◆ Read slowly many times ◆ Find meaning 	<ul style="list-style-type: none"> ◆ Read slowly many times, find meaning ◆ Guide the students to find answers
Student 2 (Male)	<ul style="list-style-type: none"> ◆ Read through textbooks ◆ Emphasis on particular parts 	<ul style="list-style-type: none"> ◆ Points out which parts to study ◆ Gives the area the exam will be in
Student 3 (Male)	<ul style="list-style-type: none"> ◆ Comprehension of assignment ◆ Trying out in practice theoretical considerations ◆ Audio tapes and notes of lectures 	Gives answers to extant and potential working problems
Student 4 (Male)	<ul style="list-style-type: none"> ◆ Reading of the textbook ◆ Notes of essential parts 	◆ No help, only provision of knowledge
Student 5 (Male)	<ul style="list-style-type: none"> ◆ Studying in a quiet environment ◆ Keeps notes 	<ul style="list-style-type: none"> ◆ Study in quite environment ◆ Further explanation of unclear points
Teacher 1	<ul style="list-style-type: none"> ◆ Individual & group-work ◆ Observing student-models 	Individual learning techniques
Teacher 2	<ul style="list-style-type: none"> ◆ Understanding theory-practice ◆ Repetition 	<ul style="list-style-type: none"> ◆ Individual help: clarification ◆ Exchange theory-practice
Teacher 3	<ul style="list-style-type: none"> ◆ Review of previous exam ◆ Self-assessment 	<ul style="list-style-type: none"> ◆ Guides how to proceed Limitations due to: <ul style="list-style-type: none"> ◆ time restrictions ◆ class structure

The students' *perception* of critical thinking involves some variation. *Student 1*

experiences it as twofold; on the one hand it includes expressing oneself on professional issues. This implies that the working matter under scrutiny has attracted one's attention. Closer examination takes place, together with the formulation of a personal judgement. This might contribute either to a personal understanding, or to further elaboration of the issue.

"To say one's opinion perhaps on various things that you wonder about within the field" (1).

On the other hand, critical thinking embraces the evaluation of one's own work. Specifically, this refers to a co-evaluation between the students and the teacher regarding the firsts' performance.

"[...] you are allowed to take part in deciding for example the grade yourself and sort of give yourself perhaps an evaluation on what you have done. [...] in theory, I'm thinking of, when you have a theoretical test then you can take part in the evaluation of it" (1).

The student thus indicates that critical thinking is not an act carried out in isolation. The *other* is present in the process, here in the sense of a discussion partner. Co-evaluation implies exchange of opinions, receiving and giving critique to the other's assessment.

The student feels that this co-evaluation is a significant part of his comprehending the way the classroom works. Firstly, it can provide information about the evaluation criteria. Personal examination of one's work, implies awareness of the goal set; discussion of it with the teacher clarifies the way the various points are assessed. Secondly, it can help him realise his weaknesses and erroneous points of his performance. When the teacher goes through the student's work, s/he points out the exact parts that need improvement, and enables the student to locate where he lacks knowledge.

"Because I have heard that there are many who disagree with the grade they have got and perhaps it helps if one is allowed to take part in and hear which mistakes they have, and that they get it more clear for themselves, what is the reason for which he gets this grade" (2).

Critical thinking, in other words, contributes to an insight regarding the status of one's theoretical knowledge and practical performance, as well as the evaluation demands.

For the *second student* critical thinking has more a nuance of criticising; the student refers to the contemplation over one's choices. Specifically, the examination of one's choice of profession and the consequences it has for one's life are underlined.

"[...] perhaps a little negative [...] you are critical to start with the car for example [...] it will be a lot of boring work...dirty work...this is what I am critical against" (2).

The student particularly emphasises the negative consequences; they are directed both

to 'psychical' and physical aspects of oneself. With the use of the adjective 'boring', the student indicates that the object of work might not completely satisfy one's interests and needs. At the same time, he refers to the type of work as being 'dirty', something that implies annoyance due to a particular body state.

In other words, critical thinking implies investigation of the negative sides of one's object of occupation, both of a psychical and a physical character.

Student 3 is more concerned with practice. He regards critical thinking as the process of finding a solution to a working problem. Specifically, the student hints at the discovery of the correct method to apply in order to execute a practical task. He refers to the overcoming of obstacles of a practical nature, for example the choice of the correct tool.

"[...] for example if you have a little problem to loosen a screw, then you have to think how it is possible to loosen it, use an extension on the screw" (1).

On the one hand, such an action requires a kind of creativity; one has to 'see' the situation with one's imagination eye, in order to find an alternative way of carrying out the chosen action. On the other hand, the role of the body is indicated. The choice of an appropriate tool involves the body, as well as physical objects. The student has to physically try the tool to 'see' if it fits the specific part he is working on, he uses his sense of touch to estimate the situation, in combination with an estimation of a more 'intellectual' kind.

Thus, critical thinking includes the discovery of a practical solution to a working problem, by use of both mental and bodily mediums.

Student 4 is unable to give a description of his experience of critical thinking; the term is totally unknown to him. At this point, it should be mentioned that the majority of the students of School 2 showed difficulties in comprehending the concept. As most of them were unfamiliar with the term 'critical thinking', I tried to rephrase the questions, in order to acquire information on the issue. However, in the case of student 4, that was unachievable¹⁰⁴.

Finally, *student 5* refers to critical thinking as involving the consideration of possible adverse consequences while engaged in working situations. He indicates that the phenomenon embraces the process of anticipating the negative effect of hazardous actions and material at the working place. The student has to examine his actions as well as the working circumstances, in relation to personal safety, his and the others'.

"[...] eventually things that can happen, and eventually danger with chemical substances like those we have at the workshop here, where

¹⁰⁴ Nevertheless, the student's unfamiliarity with the phenomenon still constitutes data. I return to this issue when examining School 1 and School 2 together.

they think critically to it. [...] What I mean is what can happen if you inhale the substance" (1).

Furthermore, the contribution of the *body* in the apprehension of critical thinking is signified. The student refers to substances that can cause physical damage; inhaling a dangerous chemical, for example, can lead to lung problems, or poisoning. Such body signals function as consequences to be considered when engaged into examination of working issues.

In other words, the student experiences critical thinking as being inquisitive regarding one's actions and environment, where the self as a physical actuality is involved.

Summing up, two observations are made. On the one hand, the students have rather diverse perceptions of the phenomenon. While student 2 and 5 present a similar experience of critical thinking, that of an attitude of criticism and scepticism, the other two students refer either to theoretical issues -elaboration of information and evaluation- or to issues related to working praxis. On the other hand, the descriptions of all the students address the practical work, be it a working assignment or one's working surroundings. Moreover, all students indicate that critical thinking is not a sole mental act; the role of the body is also acknowledged.

Analysing now the *teachers'* experiences, *teacher 1* presents critical thinking as comprising of four aspects. Firstly, she refers to the achievement of a common understanding concerning working issues. She indicates that when examining the various aspects of a working situation, with the use of experience and discussion, her and the students should reach a common understanding of what the situation consists in. The teacher here does not refer clearly to what this 'situation' is, but considering the general gestalt of her experience, it can be said that she refers to the procedure of dealing with a working problem. In other words, she discusses critical thinking as involving the examination and analysis of the various indicative elements and the reaching of a common agreement on what a working problem actually regards.

"[...] it builds on experience and through training, practice and discussion that we reach a common understanding. (1) This that we discuss and receive various elements which we evaluate and try to reach...to agree on a common understanding" (2).

This procedure is not an one-person act. The role of the *other* is necessary so as to reach a conclusion about the problem faced. The examination of the individual indicative factors and their synthesis into a comprehensive picture regarding the reasons of the problem's existence, is an operation carried out in co-operation with others. Students work together in

groups; each one should contribute by providing his/her understanding of the situation, so that the pieces of the puzzle are slowly put together.

Accordingly, critical thinking refers to the achievement of a commonly accepted apprehension of the working problem, under co-operation among the people involved.

The second component of critical thinking is a continuance of the first one; namely the discovery of different working methods that can give the same successful result, the solution to the problem. The teacher here refers to the ability of identifying more than one working approaches and techniques to a practical assignment, that once applied, are of the same effectiveness.

"This that they can see different ways to do things, to solve the assignments in different ways perhaps and still come to common or to the same results through various exercises" (3).

The above is facilitated by the acquisition of experience. When the teacher uses the word 'experience', she refers to the development of an understanding of the connection between theory and practice. The students should eventually become able to actualise in practice what they learn in the theoretical lessons, they should be able to use their theoretical knowledge while working with practical assignments.

"Critical thinking shows perhaps most under praxis, as they have got the theory and have got some experiences in the form of theory, then they have the chance to verify things and through that presentation you can be a little critical in the execution" (3).

Consequently, by trying out in various ways their theoretical knowledge, the students become eventually able of identifying more than one working methods applicable in the same type of problems faced. This implies naturally the need of training in such procedures.

"[...] through training [...]" (1).

In other words, critical thinking refers to the discovery of multiple working approaches to deal with a problem, through practising with the application of corresponding theoretical knowledge.

Thirdly, the teacher refers to the act of evaluating the teaching method, as pertaining to critical thinking.

"[...] and then we hear the students' point of view, what they think about this teaching form we use. " (7).

The teacher believes the above act contributes to the students' learning.

"And then they get the chance to be critical and through that to learn

things" (7).

Even though the teacher does not specifically elaborate what this learning consists in, she presumably refers to the fact that by assessing the teaching method, by reflecting on what is beneficial and what counterproductive, the students learn to point out the positive and negative sides of a situation. They learn to relate the effectiveness of the means used to the goals set, meaning the techniques applied in relation to whether they learn or not. This assertion stems from the experience as a whole.

Finally, the teacher indicates that critical thinking contains an inquisitive attitude concerning the learning material. The students should examine and reflect upon the information provided at school.

"[...] that they were trained to be critical to all they get of learning material." (4).

The teacher believes that this kind of training has already taken place in the previous schooling years.

"I would think that this is something carried out from the elementary school, until the upper secondary school." (4).

It is thus implied that at the present class level, no such training takes place. This assumption is reinforced by the fact that the teacher does not make any references to the issue anywhere else in the interview.

Hence, critical thinking also incorporates evaluation of the instruction and an attitude of scepticism.

The *second teacher* regards critical thinking as the process of discovering a solution to a working problem.

"[...] to find the correct solutions in the given situations" (7).

In order to identify the correct mode of action, certain factors have to be taken under consideration. The departing point is the working aim; one has to observe and elaborate those aspects of the working object that are related to the extant problem, and eventually decide how to arrive at a solution. The source of the problem, in other words, is known, and the student has to make his/her way through so as to solve it. Discovery of the appropriate actions to be executed so as to solve this problem, constitutes the student's task.

"[...] to be able to reason, both out of the observations and the problem area that lies in the bottom, so they shall be able to reason all the way to that now I must do this and this, in order for things to work, to repair what needs to be repaired" (1).

The above are carried out in co-operation with *others*. The students bear in mind others' observations regarding the working object, and exchange suggestions and evaluations on the extant problem. The information acquired in such a way is beneficial to the discovery of the solution. The teacher here refers to persons that have close connection to the working object, and are thus familiar with the problem faced.

"[...] it is directed toward the conversations with the car owner, the customer. (2) [...] in co-operation with the customer perhaps" (7).

In order to be able to evaluate all those indicative factors and reach a solution, corresponding experience is needed.

"The more experience they get, the better they are able to demonstrate critical thinking" (4).

This experience is obtained in two ways. Firstly, acquisition of knowledge in both a theoretical and practical way is necessary.

"[...] we have a mixture of theory and practice, so that in a way they get very much practice" (5).

Secondly, in order to learn how to act correctly, one has to commit mistakes. By taking a wrong step, one realises what should be avoided, and thus identifies on his/her own the correct action. This is a long-time process.

"So I believe that after they have been doing this, perhaps fail a little and make mistakes, they will be capable of a bigger ability to demonstrate critical thinking" (6).

To sum up, critical thinking includes reaching a solution to a working problem, after having considered indicative factors and having discussed them with relevant others. This process is enabled by the acquisition of experience and practice.

The *third teacher* indicates two nuances of critical thinking. Firstly, critical thinking embraces the assessment of a working situation; this is carried out by elaborating indicative elements and with the help of knowledge acquired from previous interaction with similar situations.

"It means that we must try to make students to evaluate, also based on experience, and compare with their apprehension" (1).

This examination should lead to the choice of a corresponding action to be taken, so as to solve the working problem; this constitutes the second nuance of critical thinking.

"[...] and eventually act like this and this." (1).

Arriving at a correct mode of action implies earlier practice with different kinds of working methods and tools. In other words, the students experiment while trying to find out how to deal with the problem; this experimentation includes also decisions and actions of a wrong nature. Eventually, the students get to recognise the correct way of dealing with the problem, and use this knowledge in future similar situations.

"If you do a job, you often make mistakes, at least to start with, and this is of course a way to learn, that you don't make the same mistake again, and so manage to consider new ways to work, for example use a different tool, or use the right tool, to do a job properly [...]" (2).

Repetition of such a process leads to the establishment of an automatic way of handling similar working situations, so that the right decisions and actions are taken immediately, without the interference of experimentation.

"[...] to get a routine, so that you do it correctly the first time. It is important. It is just a matter of experience and learning." (2).

In other words, critical thinking requires theoretical knowledge on the issue, previous practice with similar situations, in combination with assessment of the present factors.

With respect to all three teachers, critical thinking is more or less of a common perception. The teachers refer to the discovery of the correct solution or method to approach the problem. Praxis is central in their experiences. They all acknowledge the necessity of practice and experience, of applying in praxis what the students learn in theory, in order to arrive at a solution. Moreover, the presence of the other is significant; critical thinking appears to be an act not carried out in solitude, but in co-operation with others. Contextual factors are also essential, as they have to be taken under consideration, is the solution to be discovered.

However, the most obvious difference found is that while teacher 1 and 3 include both the *identification* and the solution of the problem as pertaining to critical thinking, teacher 2 refers only to the latter.

A possible explanation for the exclusion of the problem's *identification* as part of critical thinking, can be given when examining the class the teacher has at the moment of the interview. As she underlined herself, her students are a particular group, as they suffer from learning difficulties.

"[...] and I have a quite special class this year with the so-called 'A-candidates', who have specific and general learning difficulties." (3).

The teacher considers those students as being weak in the area of identifying working problems. She mentions specifically that they are in need of practice regarding how to gather and analyse all the indicative factors together, so as to arrive at a solution.

"[...] and it is perhaps exactly this here [...] this to be able to think and reason about things, there is a lot of training in this area here." (3).

Furthermore, the teacher acknowledges that very few students are actually able of demonstrating critical thinking.

"[...] whether they are able of it today? There are not so many of them that are cable of, I don't think so." (4).

Consequently, it can be argued that since the teacher regards her students as not being efficient when it comes to assessing elements and arriving at own conclusions about working problems, she concentrates on the issue of finding the solution to *already identified* problems, and not on the identification of the problem per se. This would require even more specialised abilities and effort, something that the teacher implies her students are not in position to demonstrate. This could be thus a reason why the teacher experiences critical thinking as including the discovery of the solution and not the problem.

Discussing now the experiences of the students and the teachers together, both similarities and differences emerge.

All the teachers underline the significance of praxis, the importance of having a solid connection between theoretical knowledge and practical application. Training is indispensable to the evaluation of the given factors and to the drawing of conclusions regarding the working problem. Moreover, the role of external factors and the others is acknowledged. The students, however, do not convey the same. Even though their perceptions are directed to practice, they still do not refer to this theory-praxis pair in the same extent as the teachers, if not at all. The students' descriptions take place in the workshop, be it the discovery of a solution or an attitude of scepticism concerning one's working actions and surroundings. A common understanding of the phenomenon does not exist; the students do not have as clear a conception as the teachers, considering the difficulty with which the first provided relevant descriptions. The majority of the answers do not provide a well-elaborated description of the phenomenon, they do not include a deeper understanding. It seems that critical thinking has not been included in discussions at school, as for some students it is actually a totally unknown term.

With respect to the *application* of critical thinking, the *first student* maintains that they

are actually not given any particular opportunity to demonstrate critical thinking. Specifically, he indicates that the teacher does not give room for self-evaluation of one's work; very few exceptions are found, and only when the students take the initiative and specifically ask for it.

"No, he [the teacher] does not say directly that we should do it, but we get to do it if we ask about it, but it is not all that do that [...]" (4).

Furthermore, the student explains that it is in the plans of the school to include them in the evaluation of their work, it is not an established praxis yet.

"It hasn't happened yet, but...we have had a project about it before...it is still going on. This is what they are trying, that the students will participate in evaluating their own tests and work." (4).

It is thus inferred that the application of critical thinking does not occur in the classroom, due to unfavourable milieu. Even though the student has the will and wish to participate in the evaluation, or to discuss working issues, the school does not provide with the appropriate circumstances.

Student 2 does not refer to the application of critical thinking in the classroom. As seen before, he indicates that being sceptical to the negative sides of working with the particular object (car) is critical thinking. As such, critical thinking is assumed to be present in a constant way. The student does not provide with further information on whether such thoughts are elicited by something in particular, but he does mention disliking the 'dirty' work assignments. Hence, its application takes place presumably while working in praxis. The implications of the adjective 'boring' are not so obvious, as the student might feel bored both during theory and praxis.

No other implications can be made for the role of other students or the teacher. However, critical thinking -or the criticism carried out- appears to be more a self-employed examination, directed toward the immediate consequences the type of work has for oneself.

"[...] you are critical to start with the car for example [...] it will be a lot of boring work...dirty work...this is what I am critical against" (2).

The *third student* purports that they are given the opportunity to demonstrate critical thinking as they are mostly working autonomously. He illustrates that the teacher does not interfere in a predominant way while handling a problem in praxis, but she leaves the students discover the solution on their own.

"[...] they [the teachers] do not come to help us, no, but if we ask for help then they come to us...you just have to try yourself." (2).

It is further implied that the student experiences this independence and responsibility

in a negative way. It seems that sometimes he wished the teacher was more often present while being in the working area.

"They do not come to help us, one has to be troubled for a good while, before they come to help us." (2).

Accordingly, the student feels he has to go through a process of experimenting. He has to try out various solutions, and make mistakes, in order to arrive at the correct mode of action. This is seen as a way to learn.

"You must try and fail, when you fail, you learn something." (2)

In other words, the application of critical thinking implies independent work with trying to find out the solution to a problem, where the role of the teacher is limited to the absolute necessary.

As mentioned above, *student 4* does not provide any direct data on critical thinking, as the concept is unknown to him. Consequently, a direct question on the application of critical thinking was unfitted.

Nevertheless, the student does provide data on the way the students proceed while working in practice. This description elicits information that can be used to elucidate the phenomenon.

Specifically, the student describes the practical work as a solitary activity. He depicts the student as being mostly on his/her own in the process of solving the working problem. Some help of what to do is found in the theory books, otherwise the student has to judge from the extant circumstances. The indicative factors have to be considered and assessed, as different solutions exist to the different kinds of problems.

"It depends on the damage, if there is a dent [...] it depends on how the dent is, if it goes through the whole paint, and in the metal, then you have to polish it totally, and then we have to use the petty knife to make it straight again. If it is a big dent, then we have to hit it out [...] some of it is found in the book, our book." (4).

The role of the teacher comes forth more directly when the student describes the case of facing a difficulty. Even though some of the problem – solution pairs are standardised, there exist situations where original procedures -or combinations of them have to be followed. The student naturally asks for the teacher's help, who provides the necessary assistance.

"I just ask the teacher. For example about things we need help with, for example if I am not totally sure whether this is totally correct and so on, on the dent [...] then I just ask him." (4).

Simultaneously, the student emphasises that this is the only circumstance when he

actually experiences the teacher working. This is described in a negative way; the student feels the teacher does not do enough, he feels most of the weight falls on the students' shoulders.

"If he works next to us who work? No, he mostly sits in his office. And then he is out with us when we ask for help, then he helps, he has little to do...I think he is, he works not so much himself, I have seen him done it once or twice, it is not so much more." (4).

The above information will be used later on, to elucidate general comments made on the application of critical thinking as described by students and teachers.

Student 5 discusses the application of critical thinking by referring to the precautions they can take in order to avoid hazardous circumstances. This in accordance to his perception of critical thinking, meaning the consideration of negative consequences of certain work circumstances.

"Yes, that we use protective equipment" (2).

In other words, the application of critical thinking is of a pure practical nature; it signifies to take action in accordance with the possible adverse incidents one has considered previously, at a theoretical level.

The teacher's role here is that of a reminder; in case the students do not follow the precaution measures, she points out what is the correct action to take. This implies that the students are not given the incentive to consider the consequences of not following such precautions on their own; the teacher indicates what to do.

"If he sees us without a protective equipment, he comes and points out that we shall use things to save out health." (2).

Seeing the students' experiences of the application of critical thinking together, the following observations can be made.

Firstly, most of the students are quite clear on the issue. Student 1 categorically states that they are not given any chance to demonstrate critical thinking, while students 3 and 5 state the opposite. The case of the second student is quite particular, as the nature of his perception in itself, does not allow speculations on specific situations where application of critical thinking takes place. Instead, critical thinking seems to be an ongoing procedure, a kind of consideration that is always 'at the back of his head'. No further comments on circumstances or the role of the others can be made.

Secondly, the cases where the students support critical thinking is present in the classroom have to be examined more carefully.

On the one hand, student 3 claims the application takes place as they most often work on their own, without the teacher's interference. Critical thinking for the student means to find the solution on his own; as he is working alone, that implies that critical thinking is applied. But does independent work guarantee demonstration of critical thinking? Is leaving the students to work on their own the only condition necessary for the application of critical thinking?

In other words, when the students are engaged into a working problem, that does not necessarily mean that they will arrive at the solution –and thus demonstrate critical thinking. When the student is asked how he identifies the correct way to proceed, he mentions going through a process of trying out various ideas, failing, and eventually discovering the correct action to be taken. He himself characterises this as a way to learn; does that mean that critical thinking and learning are experienced as identical by the student? Is trying and failing the only way to apply critical thinking? If we go back to the student's perception of the phenomenon, we see that the example given refers to the choice of the correct working means in order to achieve the specific goal. The student characteristically says:

"[...] you have to think how it is possible to loosen it [...]" (1).

The use of the verb 'think' implies something more than try and fail. It signifies other mental steps that need to be taken in relation to physically trying out solutions. Thus, the situation the student refers to as a case of critical thinking application is not entirely accurate, seen in relation to what the student perceives as critical thinking.

Similarly, student 5 elucidates the application of critical thinking by saying that they make use of precaution measures so as to prevent an unfortunate incident. Nevertheless, when asked specifically what the teacher does so as to provide with an opportunity to apply critical thinking, the student answers that she comes with instructions of what to do. Put differently, how the *students* apply critical thinking is to follow what the *teacher* says. It seems that the student confuses the action that is taken as a *consequence* of critical thinking –i.e. use of a protective mask so as to avoid inhaling poisonous chemicals- with the *application* of critical thinking. An example of the latter would be to let the students find out possible hazardous situations and substances in the working place, what possible acts might lead to a dangerous situation, and what specific actions can be taken in order to prevent that from happening.

It is thus implied either that the student *cannot* provide with a specific situation where critical thinking is applied –always according to his perception of the concept- or that he *does not have* such an experience. The answer to that is unfortunately not likely to be given here, as

the data do not elicit such information. However, an assertion can be made, taken into account the student's way of being during the interview. As mentioned above, the student answers the questions on the meaning of critical thinking with quite some difficulty. At first he feels it is strenuous for him to answer, and only when the question is rephrased does he come up with an example.

"To think critically...when things happen...eventually...perhaps...I don't know [...] It is difficult for me to answer." (1).

Hence, the not so successful illustration of how critical thinking is applied, can be attributed to the relatively little knowledge the student has on the issue. The difficulty he faces in describing the phenomenon signifies a lack of deep knowledge on it; it is implied that the student has not faced the same issue before, has not ever thought of if and how critical thinking is applied at school.

With regard to the teachers, *teacher 1* describes two ways that critical thinking is applied at school.

Firstly, the students are given the opportunity to acquire experience by receiving training of both a theoretical and a practical character. Knowledge that is acquired at a theoretical level is being applied in praxis.

"We use a number of practical exercises, among others that we first go through theory and then we carry out practice, so as to experience what one gets in theory, later in praxis [...]" (3).

This pair of theory-praxis is significant in one's training, as the assignments carried out in practice clarify the theory learnt. The student has the opportunity to 'see' in praxis what s/he reads and hears during the theoretical classes. By being physically involved in a practical work, by testing out the theoretical knowledge, the student acquires an insight; what was a theoretical entity before, now takes a more 'real' form, and the meaning and significance of the theoretical knowledge comes forth.

"[...] one verifies the theory we have gone through" (3).

Secondly, the teacher explains that the students have the opportunity to express criticism as they are expected to evaluate the teaching techniques used. She specifically refers to the combination of theory-praxis as a learning method, and whether the students believe they benefit from it or not.

"[...] it is the evaluation we go through afterwards, on the very process in the theory-praxis, (6) [...] and then we hear the students' point of view, what they think about this learning form we use. " (7).

Parallely, the application of critical thinking is facilitated by the instructional method employed. Those students that face difficulties into carrying out successfully this pair of theory-praxis, can be helped in certain ways. The teacher specifies that students have different needs; they possess different abilities, –or abilities of different level- they learn in a variety of ways, their personality and individuality is embraced by different socio-economical factors. All those individual differences have to be addressed, if the student is to be effective in learning.

"[...] to include all [the students], there are different departing points, and different background in the various students." (5).

Thus, the school offers a kind of teaching which is accommodated more to the individual needs. This could mean the use of special learning means, or the use of two teachers simultaneously in the same class. More time is devoted to each student, in a more personalised manner, so that everyone can benefit from the learning situation.

"We can help them by using special teaching, that then they get to adjust a bit better, they get perhaps other helping means, also get the two-teachers-system –so that there are more teachers that help in the same class [...]" (5).

In other words, the application of critical thinking can be promoted by taking into account the particularities of each student and by adjusting the teaching method accordingly.

Teacher 2 explains critical thinking is applied as the students are given the opportunity to evaluate working problems on their own.

"That they are allowed to examine things on their own[...] they are at least given the opportunity to evaluate from their point of view how things are, and that they are allowed to find out on their own." (8).

The teacher specifies that during this examination, the students try out various solutions that they think will work; not all of them can be successful, but eventually the correct action is being taken. Thus, the students learn more effectively the right procedure, as doing something wrongly, with perhaps unfortunate consequences, has a stronger possibility of being remembered, than doing something correctly. In other words, experimenting and making mistakes leads to learning.

"[...] to work, make mistakes, because if there is something you can learn from, that is the mistakes, and it is perhaps those that you remember; those times that is goes well, you don't remember anything." (8).

However, the teacher admits the students do not receive any particular training in

critical thinking. She does not employ any special techniques or deliver assignments specially designed so that the students can learn how to demonstrate critical thinking.

"And perhaps in the true sense of the word, the students are not trained so enormously much in exactly this here with critical judgement [...]" (8).

Some further clarification is necessary at this point. The teacher mentioned earlier that critical thinking embraces the discovery of the correct action to be taken after having considered relevant indicators. Here, she indicates that part of the students' training includes experimenting with a working problem and trying to find the solution on their own. In other words, the students are given the *opportunity* to demonstrate critical thinking, i.e. to discover on their own the right action to take. However, whether they apply critical thinking or not depends on their ability and effectiveness in evaluating all the given factors and combining them in a fruitful way that leads to the problem's solution. It is at this point that the teacher indicates that the students lack a special training into critical thinking; they are given the chance to apply it, but not the necessary means.

Having said that, the teacher also presents another case when the students can apply critical thinking. She specifically refers to the assessment of the indicative factors, to the exchange of information with relevant others. The students are given the opportunity to discuss the problem with the owner of the car, meaning with the person who has perhaps the most direct experience with the problem's symptoms. The student can use his/her knowledge in collecting the information which is relevant at the given situation, can ask for further specification, evaluate what is significant for the discovery of the solution.

"[...] to express oneself concisely in argument, disputation and demonstration. It is directed to the conversations with the car owner, the customer. So it is exactly in the bottom of what we are doing [...]"(2).

At the same time that the teacher identifies situations where critical thinking can be applied, she acknowledges the difficulties some students might have in doing so. In particular, she believes that certain factors can facilitate or impede the demonstration of critical thinking.

Firstly, the appropriate teaching technique can be helpful regard to grasping the essence of the theory learnt, and translating it into practice.

"[...] and the way I have laid out much of the teaching this year [...] we have a combination of theory and praxis, so that in a way they train a lot with practical things." (5).

In other words, both types of training are essential in learning how to proceed in an

efficient way; the teacher also mentions that this way has been proven to be fruitful.

"And it is at least the feedback that we have had so far, it works much better than a pure theoretical teaching [...]" (5).

However, in order for the above method to work, the particular characteristics of the students have to be taken into account. As mentioned above, the teacher stresses the fact that her class comprises of students that suffer from learning difficulties. Their weaknesses and particularities have to be considered, so as to choose the appropriate teaching method. The combination of theory-praxis, for example, is effective for this group of students.

"[...] it works much better [...] for this class here, I shall point out."
(5).

The best way to overcome obstacles concerning training effectively, is to consider each student individually, and to examine what the specific problems and difficulties faced are.

"It refers much to this here, to take after the person concerned individually [...]" (9).

This is put into practice by engaging two teachers at the same time during the practical parts of the students' training. In that way, the teachers have more time to engage into the individual student, to get to know the individual problems and offer help accordingly.

"[...] I have this class, so I have support in the practical part, we are two teachers all the time, so we get more time for the individual student, so that we can go in and contribute and help a bit more in various areas [...]" (9).

The teachers' help consists in providing the students with challenges and incentives, turning their attention to crucial issues, so that they can themselves come up with observations and suggestions of how things are. In other words, the teachers do not come with a ready-made answer to the students' questions, but help them come with the answer themselves.

"[...] it is to try to talk with them and try to make them use their head and inner abilities." (9).

Furthermore, the method of engaging two teachers does not only help the students by pertaining to their particular needs, but also by providing them with various ways of presenting the learning material. Each teacher uses her particular way to clarify and elaborate the learning object, so that the same issue is illustrated in various ways. This, in addition to the textbooks' presentation, enables the students to develop and understanding and insight into

the knowledge given.

"And the book says things in its way, I say things in my way, [...] and the other teacher can come in and say things in his way. And in the end the pieces of the puzzle are perhaps put together." (11).

In other words, the application of critical thinking is facilitated when the individual needs of the students are addressed, and when the learning material is presented in a variety of ways, so that comprehension can occur. In addition, the students are encouraged to discover the answers to their questions on their own.

The *third teacher* claims that critical thinking is applied as the students are given the opportunity to try and solve a working problem on their own.

"[...] when we are at the workshop [...] they are allowed to try themselves [...]" (3).

Specifically, a combination of theory and praxis takes place. When faced with a particular problem, the theoretical side of it is first examined. The aim is to isolate the factors that play a significant role for the solution of the problem.

"[...] we go through first, let's say a job that has to be done, theoretically, point at things that are important, things that are very important [...]" (3).

Once the theoretical basis and corresponding observations have been established, the next step is to describe the way of proceeding in order to solve the problem. The teacher explains the students first are given orally the main actions to be taken, in the correct order, and then are allowed to apply all them in practice. They work physically on the working object and try to repair the damage.

"[...] and then [we go through] the way things should be done. The order, we do this first, then you do this, and this, and then they are allowed to try themselves [...]" (9).

The teacher continues by underlying that if the students face some difficulty, if they are uncertain of what to do next, they turn to the teacher for help. She, in turn, points out the correct way to proceed, which actions should be taken, and which are to be avoided.

"[...] and if they are stuck, they can of course ask, and then you explain that this you should do, and this you shouldn't do." (9).

She finally states that the students go through similar assignments many times, so as to learn the correct way to solve such working problems.

"[...] And they get to do that many times, so they eventually learn." (9).

Commenting on the above, it is indicated that the students apply critical thinking by actually following the given instructions. The teacher states the students are allowed to try and carry out a working assignment on their own; however, when she actually describes a corresponding situation, what comes forth is that the students hear from the teacher the elaboration of the problem at a theoretical level, and then are given the steps to be followed in praxis. Hence, the student has a passive role as an executor of a given assignment, where the only active action is to put in practice what is given in theory. This observation becomes more clear when the teacher explains how eventual difficulties are dealt with. The students that come to her with a question of how to proceed, are given the answer and instructed on what to do next. No indication from the teacher is given about an elaboration from the students' part. The training they get is with repeated praxis, meaning going through similar procedures many times, so that behavioural patterns are established and become an automated routine.

In other words, the teacher's description of the application of critical thinking does not correspond to her perception of critical thinking. As seen above, she refers to the evaluation of indicative factors based on experience and knowledge, so that the correct way to proceed can be established. Later on, however, she indicates that the application of critical thinking is actually an execution of instructions. The process of assessing and elaborating elements is not present.

The inconsistency observed cannot be clearly elucidated by the data. Nevertheless, taking the experience as a whole, some assumptions can be made.

It seems that the teacher operates at two levels of discourse; the ideal situation and the reality. What she describes as critical thinking, the investigation, elaboration and synthesis of indicative factors into a complete picture, is the ideal situation. Were the students to be effective professionals, would they be able to execute successfully this kind of process. However, when it comes to the application of critical thinking, namely the real situation, not all of the above are fulfilled. As the teacher mentions, students are of different capacities and needs; they have to be addressed individually if their full potential is to be developed. Concerning particularly the present students, the teacher acknowledges they are characterised by certain weaknesses, as they suffer from learning difficulties.

"and part of the students we have, suffer from certain learning difficulties; it can be dyslexia, for example, some suffer also from that, learning difficulties in general [...]" (5).

The teacher indicates those learning difficulties influence the execution of this type of elaboration that pertains to critical thinking. She experiences them as being weak regarding

both the apprehension of theory and the execution of a practical assignment.

"[...] it is a problem we have daily, because they are quite weak at theory, and some are very weak also in practice, to do a job." (5).

Consequently, the above weaknesses do not allow those students to carry out the evaluation of the indicative factors, and eventually work with solving the problem, as they lack the required level of theoretical knowledge and the corresponding practical skills. In other words, those students are not in a position to apply critical thinking. It is therefore why the teacher limits this application to the almost pure execution of given instructions, when she describes the situation in the workshop. She experiences that the students are not capable of carrying out the whole process, and thus gives them responsibility for only part of it.

Examination of the three teachers together reveals many common points. All teachers support that the application of critical thinking mainly occurs in the workshop, when employing praxis. They emphasise the need to combine theoretical lessons with practical ones, as the ability to effectively apply theory on real working problems is the crucial point in the students' training.

However, the teachers attribute different degrees of freedom and responsibility to their students. Even though they all state that the students are allowed to elaborate a working problem on their own, the actual actions taken differ in character. Whereas the first teacher does not provide corresponding information, the second and third teacher illustrate that the students employ a process of experimenting and making mistakes, in order to discover the correct solution. Teacher 2 specifies the students are not trained particularly into demonstrating critical thinking, and teacher 3 limits the application of critical thinking to the level of execution. It seems that the opportunity to apply critical thinking is there, but the means to do so, or the given training are rather limited.

Furthermore, all teachers relate the demonstration of critical thinking to the students' abilities and level of effectiveness at school. They all mention the fact that the students suffer from various learning difficulties, and that special, individual teaching is required. They support that the students are weak in the thoughts and actions involved in critical thinking, also due to their particular condition. This conviction influences the teachers' way of carrying out the lessons, the content of the instruction, their perception of the skills the students possess, and the kind of assignments they are given to solve, accordingly.

A parallel examination of the students' and the teachers' experiences of the application of critical thinking unfolds a common factor; even though the opportunity to demonstrate critical thinking is provided, an actual application does not take place. This is shown

especially into the descriptions of teachers 2 and 3, where they indicate that the students assume the role of an executor, of a trainee that learns by trying out and making mistakes. The responsibility to take major decisions regarding working assignments is not given to the students, as they mostly follow instructions while working in practice. The same appears in the case of the students who describe situations where critical thinking takes place; they either describe the consequences of applying critical thinking, or the way they follow instructions.

Moreover, the teachers stress the importance of leaving the students to work independently, so that they can exercise their skills in order to evaluate and solve the problem. The students, however, do not experience this autonomy in the same way, they do not perceive it as a chance to assume responsibility and take decisions; they rather think negatively of their teachers, that they either do not work enough, or that they are left alone to struggle with the assignment. This is clearly shown in the description given by student 4. He vividly sketches the teacher as one who sits in her office and appears mainly only when asked for help. This absence is not interpreted into a chance to build up one's skills and abilities.

Consequently, being left on one's own does not automatically mean applying critical thinking. It seems that the students do not always know what to do, how to proceed so as to arrive at a solution. The skills, techniques and methods, in other words, the student should possess in order to apply critical thinking, seem not to be totally present.

Finally, it seems that the students ascribe the possibility of applying critical thinking more to contextual factors, whereas the teachers to factors related to the students' abilities. Student 1 for example mentions that it is up to the school to encourage them and provide the opportunity to evaluate their performance, and the other students refer to the necessity of being left to work on their own, something that again depends on the teacher. The teachers, on the contrary, stress that the difficulty encountered in applying critical thinking is mainly due to the students not possessing the required skills and abilities. The teachers attribute quite a significance to the fact that the students suffer from learning difficulties; this is seen as a major factor determining the demonstration of critical thinking.

In the above situation, the participants' experiences of *learning strategies* are now added. Regarding particularly the *students' techniques*, the majority of the students connote the significance of understanding the written material.

Student 1, specifically, illustrates he goes through the textbook many times, so as to get an insight of its content.

"We go through it [the reading material] slowly and read it many times [...] (5).

The *second student* talks about how to handle the material. He acknowledges facing difficulties with the amount of theory they have to master, both in the sense of volume and with regard to the subject areas covered.

"It is very big, what we talked about, covers a quite large area, so we have quite some things to learn. (5) You should actually read everything, to learn of everything, it is quite difficult." (7).

He describes a similar to the previous student method; he reads the textbook and the notes taken during the lessons, especially examining those parts where he feels he does not possess knowledge about, those parts he faces most difficulties with.

"You should read through the book in the course, go through things where I don't know much about, go through the notes you have written down." (3).

Student 3 has a somehow different approach. He also mentions the importance of comprehending the assignments given, but he does not only commit an examination of a theoretical kind. He also feels it is helpful to 'see' the things presented in theory in a real situation. In other words, he goes to the workshop and tries the theory out on the working object, the car. It is a way to facilitate and enrich his apprehension.

"That was it: I have to really comprehend the assignments first of all, and then...if it has something to do with cars, so it helps a lot to go to the car and see and work on it." (3).

The above practical way of studying is also accompanied by use of tapes with the recorded lessons. The student explains that he suffers from reading and writing difficulties, so the use of a learning means other than the book is necessary.

"For example I have reading and writing difficulties so I use tapes, so I read and listen to them [...]" (4).

Student's 4 studying techniques are similar to the first students; he goes through the textbook and at the same time keeps notes of the information he needs to pay particular attention to. This isolation of certain information is rather helpful for the student, as the identification of the main points enables him to learn in a more effective way. The material is broken down in smaller units, which contain some meaning and are thus easier to be dealt with, in contrast to handling the whole of the book at once.

"When I prepare myself for the exams, I sit with a pen and paper, and I write down what I think is important, and I read the books and so on. I feel that I learn quite much when I do that, instead of just sitting and reading, and reading, and reading." (2).

Finally, the *fifth student* underlines the importance of the surroundings. He mentions he chooses a place where he can study undisturbed, where his concentration is directed exclusively to the learning material.

"What I would rather do is to sit home in the room and be engaged in [studying] in peace and quiet, without any disturbances." (3).

Specifically, he studies both the textbook and his own notes, taken during the school year.

"I have taken notes [...] of what we have gone through in the school year." (3).

Commenting generally on the above, the techniques described by the students have no relation to critical thinking. They refer to the way of handling the learning material, i.e. of isolating main points, reading so as to understand the content. No reference is made to methods that could be useful in the application of critical thinking, as described previously. The evaluation of their work, or the process of solving a working problem does not seem to be facilitated by the techniques mentioned here. They are addressing rather theoretical understanding, and not praxis.

The only exception to the above is the third student, who uses a combination of theoretical studying and practical application. He mentions the usefulness of trying out in practice what he reads in the textbooks. In other words, the actual application of theoretical knowledge is a technique that can assist him in the discovery of the solution to a working problem, i.e. to the application of critical thinking.

The students' descriptions are quite different from what the teachers express on the same issue. *Teacher 1* believes the students can be helped to learn when they work in groups. After having tried on their own, they usually form spontaneously small groups and work together; in that way they have the chance to exchange ideas, knowledge, and help each other.

"It regards this to work alone and then work in groups, it is often so that automatically the students come together two and two and help each other. Experience has shown this is a good way to learn." (8).

In addition, the teacher feels that a good method is to use a skilful student as an assistant, as someone that can provide help to the students who face difficulties in carrying out the assignments. The students benefit, in other words, from this kind of guidance, by both watching and working together with a student acknowledged to be able of executing the various tasks. In other words, this student functions as a model of how work should be done.

"[...] to pick up the strong student, to let him show his abilities, by

perhaps helping the weaker student. The weak benefits from the opposite." (8).

Accordingly, the teacher seems not to underline any techniques that could contribute to the employment of critical thinking, as expressed by him previously. It seems that the experience that he purported earlier as being requisite to the application of critical thinking can be acquired by a kind of imitation of a skilful students' actions. There are not any special techniques that reinforce the students' capability of identifying important factors and evaluating them in a way that leads to the solution of the working problem. The students are not given any training on that matter.

It should not be ignored, however, that the teacher mentions group-work as a helpful technique. By communicating with each other, the students are enabled to achieve this common understanding the teacher perceived as part of critical thinking. Still, when it comes to the assessment of the processes and methods, the students do not seem to have any training with relevant processes.

The *second teacher* identifies two ways the students can be prepared for the exams in a successful way.

Firstly, the understanding of the connection between theory and praxis is of chief significance. The students should train by exchanging theoretical lessons with working in practice at the workshop, on analogous issues.

"[...] we go through theory and praxis, side by side, and exchange between them all the time, take a little bit of theory now and a little bit of theory later...and then all the theory will be directed exactly to this area that we work with now [...]." (12).

The teacher acknowledges, in other words, the contribution of both types of training to a successful preparation. She feels it is crucial to have a close connection, not only seen from the content point of view –i.e. that the same issue is examined both in theory and in praxis– but also regarding time closeness. If the practical application is delayed, the students cannot benefit so much from this exchange. It is important to work on the object, to attain a physical contact with the working object and see, touch, try out physically what is presented at a theoretical level.

"[...] as it was before, we were perhaps engaged into motors, and an area within motors early in the autumn, while the student had not had the chance yet to screw on the motor long before the next semester, and then there will be a kind of gap in between." (13).

The above way of training is particularly useful for those who do not possess so much

knowledge or experience on the subject; the beginners need this exchange so as to easier make the required connections, and build up a solid basis.

"[...] Especially for those who have a little experience from before, and know very few things, if not anything about cars from before."
(13).

Secondly, the students can benefit from repetition; as the learning material consists of various sub-areas, the time distance between what was examined in the beginning of the school year and the exams can be quite long. Repetition is thus necessary, so as to reinforce memory on those issues. In other words, understanding of theory and applying it in praxis does not always suffice in order to achieve successful results; frequent re-examination of the material is necessary, so as to acquire a solid knowledge basis and praxis routines.

"Because now we use a certain number of weeks to go through the various areas in the car subjects, and so it will of course be a round with repetition before the exams [...] it would be long time until the exams come, so we must have repetition on the way." (15).

As seen from the above, the teacher refers to techniques which can enable the students comprehend the learning material and obtain an easiness while applying theory in praxis. This, however, does not automatically mean that the students also exercise those skills and abilities necessary in evaluating the working situation, i.e. in applying critical thinking. More emphasis is given in understanding and getting an insight on the subject's nature and content, rather than a further training in how to assess working situations and proceed accordingly.

The *third teacher* indicates the students can have a successful exam as they are prepared through training with both theory and praxis. Specifically, the students have the opportunity to examine a previously given exam assignment, both at a theoretical and at a practical level. This requires first contemplating on the nature of the problem given, the way to proceed, the appropriate means to be used, and then application on the physical object.

"There we have a combination of theoretical and practical work. So what happens before the exams, is that of course we go through, together with the students, a previous exam assignment, for example, and then we say that there is a part first that regards assessment. That means you should think about how you will solve such an assignment. And then you shall write it down on paper, that, OK, I will do this and this and this, and then you shall think about it. And they should also evaluate which tools they will use, and then execute the practical part." (4).

In other words, a useful technique is to practise with similar assignments, to evaluate a working problem and plan its solution in theory, and then execute it in praxis. Moreover, a self-evaluation occurs afterwards, as the students judge their own performance, identify their

mistakes and weaknesses, and suggest possible ways to improve the results.

"So afterwards they have an evaluation part, where they answer written how you think you did, what is it you are weakest in, and what you should have done differently." (4).

It thus seems that the teacher provides the students with opportunities to practice with working assignments that call for evaluation and discovery of the solution, in other words with the application of critical thinking. The process the students go through -i.e. theoretical consideration of the situation given and practical execution of the suggested solution- can enable them to develop what is necessary in order to apply critical thinking. Besides, the self-evaluation that follows, offers an insight to one's knowledge and potential, an indication of what the student needs to work with so as to improve performance.

However, it is still unclear how deep this training with previous assignments goes. The data do not indicate whether the students learn how to evaluate the working situation, e.g. what factors to look at, how to synthesise the various indications, how to choose the theory to use in order to find a solution. We cannot thus say whether the actual techniques to employ critical thinking are provided, or simply the opportunity to do so.

The above observations can be further elucidated by the participants' experiences of the *teacher's role*.

Student 1 explains the teacher advises them to go slowly through the reading material and try to capture its content, to comprehend its meaning.

"[...] one should go through it [the textbook] many times, and see properly what is said there." (5).

In addition, when the student faces difficulties in carrying the above, the teacher tries to guide him in discovering the answer on his own. The teacher does not provide the answer directly, but asks for the student's comprehension, so as to make him aware of his own understanding. Moreover, the teacher uses techniques that enable the student to understand the content, i.e. indicates whether the student is on the right path or not, rephrases the content, or presents relevant information on it.

"He doesn't give me any answer, anyway, but he can give me a hint, a little hint, or...talk a bit around the question, perhaps he asks me what I think it is, and if I answer correctly, then he says that it is right...then I understand better." (6).

The teacher in other words facilitates understanding in a way that activates the student's own contemplation and examination mechanisms.

We thus see a similarity between the above investigation of the meaning of the

textbook and the student's perception of critical thinking, i.e. to express own thoughts around the subject. However, the other part of the phenomenon, the self-evaluation of one's work does not seem to be practised here. The student does not mention any techniques the teacher uses within this area.

Student 2 talks about the ways to handle the big volume of the learning material. He indicates that the teacher offers advice on which parts of the textbook the students should concentrate on, or which area of the ones covered the exams will be on.

"He gives us the theme and subjects [...] sort of generally, what we will have on the test. (4) [...] He can tell you what you should read, preferably a bit more thoroughly, perhaps you should read this and this chapter, there are so many different things there." (6).

In other words, the teacher's role is limited to providing the students with a selection of parts from the textbooks, to indicating what the students should consider as more important in relation to the exams. There is no reference to training the students into how to discover those parts on their own, or to any other techniques that could enable them with what the student considers critical thinking.

Student 3 expresses a similar situation. He claims that when he faces difficulties, the teacher offers her advise on how to proceed. She indicates the next step in solving the working problem, what to do next in order to overcome the problem faced.

"If there is something special we wonder about, he gives us advice [...] on how you solve some problems and this that can come up." (5).

The above does not signify any technique in relation to the application of critical thinking, i.e. the discovery of a solution to a working problem. As the teacher mainly suggests what to do next, the students are not really trained into the process of evaluating the indicative factors and thus arriving at the solution. They rather follow the teacher's suggestions, thus being more executors than creators. The provision of an answer is very different from the guidance on *how* to find the answer.

The *fourth student* has a similar experience. He mentions not having had any training with how to study effectively at present; this is something he has had in previous schooling. The teacher rather points out the parts the students should concentrate on reading, provides with ready-made answers, but no training in how to identify such parts, for example.

"We get to know what to read [...] I learnt from my teacher in the lower secondary school how to do that [read in an effective way] He just says you must read this, it is the only thing." (3).

The student adds that the teacher can explain the area the student faces problems with

by presenting various aspects of it, but the student has most of the responsibility of finding the best way to study the written text. They have the opportunity to cover part of it during the lessons, where they examine its content and meaning, but otherwise, they do not receive any such training.

"He can tell me about the theme, like painting, and what kind of paint and so on, he can do that...but this to read, then we are on our own, besides what we do in the classroom, that which is obligatory." (3).

As the student does not provide any information regarding the concept of critical thinking, the above has to be seen in relation to his description of the way they execute a practical job. As seen before, he mentions being left mostly on his own, with the teacher not participating unless asked to help. This, together with the above, indicate that the students do not actually receive special training with how to handle either the reading material or the practical work, it is more a matter of following instructions and practising so as to obtain routines.

Finally, the *fifth student* refers to the instructions they receive from the teacher regarding the studying surroundings. The teacher points out that disturbances of various nature, for example noise, can interfere with studying, and should thus be avoided.

"He reminds us all the time that we must, he says that music and such disturbs us when we read." (4).

Besides, when asked particularly to assist the students with their studying, the teacher examines closely the areas the students have difficulties in comprehending, and provides with an explanation.

"He helps us and goes through the pages we have problems with and points out and explains further what it means." (4).

In other words, it seems that the teacher does not provide with a particular training in techniques beneficial to the employment of critical thinking. The student did not refer to the examination of the working environment, for example, and how to deal with eventual dangers. The teacher's role is to advise the students on how to manage situational factors and provides with further explanation. Again, the students seem to follow instructions.

To sum up, the experiences of the students indicate the lack of training with techniques addressing issues involved in critical thinking. They mostly receive instructions on either what to read or what to do next, rather than how to read and how to discover the next step to be taken.

The exception here is student 1, who mentions that the teacher guides rather than leads

the students in the discovery of the answers to their questions.

It should also be mentioned here that the studying techniques the students described above and the teacher's role have a great similarity in some of the students. When asked to describe what kind of help the teacher provides, the students repeat what they already referred to as studying techniques; this is most clearly shown in the students 1 and 5. This similarity reinforces in a way the aforementioned observations. The students follow the teacher's instructions, learn by heart what is best to do, the best way to study, and reproduce it for the researcher. The personal contribution, preferences, problematic and thoughts are almost completely absent. The students do not learn to arrive at own conclusions and judgements, but learn by heart what to do, follow and execute suggestions.

Let us now examine the above in relation to the teachers' descriptions of their own contribution.

Teacher 1 refers to the use of various teaching techniques, in order to adjust to the individual needs of the students. She acknowledges the importance of considering the students' abilities and level of knowledge in the effort to obtain effective learning. She thus refers to the two-teachers system, the simultaneous presence of two teachers in the same classroom, so as more time exist for a more personal teaching.

"We can help them by using special teaching, that then they get to adjust a bit better, they get perhaps other helping means, also get the two-teachers-system –so that there are more teachers that help in the same class...to include all [the students], there are different departing points, and different background in the various students." (5).

In other words, accommodation to the individual needs is what the teacher does, without though specifying what exactly this consists in. It is not easy to make a direct connection between that and the acquisition of experience, for example, necessary to discover various ways of solving working problems, i.e. of demonstrating critical thinking. It is implied that the teacher is more concerned about how the students can deal with the learning material, meaning their degree of understanding and grasping its content. However, the training into techniques that enable the student carry some of these functions on his/her own, are not present.

The *second teacher* refers to a similar method, the teaching at a more individual level. Especially when it comes to a restricted knowledge sub-area, the teacher supports there is enough time for an examination of the material with the student that faces difficulties separately.

"We have time to go and take this student, as it will probably be

within a relatively narrow area, this we have time for." (16).

Specifically, the teacher emphasises the use of both theory and praxis so as to assist the individual student. She feels it is essential to 'see' on the working object what is being said in the theory. Her role is to make this connection together with the student, so as to enhance understanding.

"And all the time there will be a kind of interaction between the various modules, if we are finished with the 'engine' in quotes, then it will not be the same with the engine, we will be not finished as long as we have with the car to do. The car is there and we go a bit back and talk about things." (16).

The teacher explains that by applying theory on the actual car, she explains further what has been studied in theory; she feels it is necessary to repeat many times various parts, so as to obtain complete comprehension.

"Clear explanation, both explanation and repetition of the explanation [...]" (17).

Parallely, the students are encouraged to try on their own and commit mistakes so as to discover eventually the correct mode of acting, as also seen above.

"[...] and to be allowed to try and fail "(17).

Finally, the teacher mentions that the students have shown positive reactions on this way of learning, of experimenting and making mistakes.

"It seems that it works [...] the feedback we have had from the students on this way to carry it out [the lesson] it is absolutely positive at least." (18).

In other words, it is implied that the students receive partly a type of training into demonstrating critical thinking. The evaluation of the working situations is facilitated by the fact that they apply in praxis what they learn in theory, by being trained into apprehending this connection. They can thus make use of the appropriate knowledge sub-area required to solve problems, can make the appropriate associations and carry out assessments. Nevertheless, this does not suffice for the application of critical thinking as expressed previously by the teacher. The judgement of the external criteria, for instance, is not being mentioned here. The students are mostly occupied with acquiring understanding of the subject matter, where own judgements, assessment, and decisions are not directly included. Again, the pair try-failure might lead to learning, but it does not necessarily provide with the skills required in the demonstration of critical thinking. It seems more like another form of 'by heart learning' rather than own discovery and creation.

The *third teacher* indicates that when the students ask for help, she leads them on how to proceed. School subjects like hers ask for experience; as she is more experienced than the students, she uses knowledge stemming out from that and instructs the students which steps to take, and which to avoid. The students, in other words, receive direct answers to their questions, they get to know what to do.

"The practical first, there we try of course with our own experience to say that this is what you do, do like this and his, it concerns one's own experience, purely regarding the profession [...]" (7).

Subsequently, the teacher believes that without the necessary experience, the students cannot proceed with the practical work. She needs to guide them through the work, as they are quite fresh in the subject and lack the required knowledge. This, however, implies the lack of teaching of any techniques that could enable the students discover ways to proceed on their own. By setting experience on the highest requirement, the teacher rules out the inclusion of learning strategies in the students' education. If experience is the number one factor determining their performance, there cannot be any other techniques beneficial for the evaluation and execution of the work.

Besides, the above statement comes actually in contrast to what the teacher discussed earlier on, namely critical thinking and its application. How can the students be expected to solve problems on their own, when the necessary techniques are not learnt? How can the application of critical thinking be actualised?

The teacher's position is further elucidated by her account on why the students face so many difficulties and need to be instructed on what to do. She explains that a large number of them suffer from learning difficulties; this fact influences their daily school performance, both at a theoretical and at a practical level.

"and part of the students we have, suffer from certain learning difficulties; it can be dyslexia, for example, some suffer also from that, learning difficulties in general, and it is not a problem only with the exams, it is a problem we have daily, because one is rather weak theoretically, and some are very weak, also purely in practice, to do a job." (5).

Hence, it is suggested that those who suffer from learning difficulties are in a disadvantageous position, and are helped by being provided with what to do, try it out, fail and eventually learn what is the correct action. This way of acquiring experience is considered to be the best, as those students find it difficult to comprehend the theory in depth, and to apply it in practice.

Furthermore, the teacher supports that an additional problem is posed, as the time is

not ample to help those students individually. As the class is not homogeneous regarding the level of proficiency the students possess, concentrating on a group of students at a time would disturb the natural flow of the lesson. In other words, both time restrictions and the structure of the classroom do not allow a more individual instruction.

"So there is a big distance between the students really. And we have too little time to use for each student [...] if we have weak students and use too much time there, then it will be disorder in the classroom, because those who are competent, they will find something else meanwhile, so there will be a mess [...] at some teachers there will be noise. And that affects the teaching for all." (6).

As a result, the weaker students participate less in the classroom, as they face problems in following the rest.

"[...] so those who are the weakest, it is those who say less [...] and we of course try to correct this [...]" (6).

Hence, the teacher points out the problems arising when the class consists of students of a various level of performance. She emphasises the individual needs, the different amount of time and/or learning methods each student requires so as to comprehend the information given.

"Some must hear it two and three times before they even understand it, and perhaps more times, it varies of course. And the same with the theory, you might stand and talk to a class for an hour without them having understood anything." (8).

The teacher continues describing possible hindrances to the smooth execution of the lesson. In addition to the varying student aptitude, the amount of concentration and attention paid by the students also plays a role. If they are not willing to show the required effort in order to apprehend the lesson, the lesson is not productive for them.

"it also depends on the time of the day. The last two hours on Friday, there is actually no point in having for example mechanics, because they are in another place, up in their head." (9).

However, the teacher can still influence the lesson effect, by adopting a learning method that can help overcome the problem. She specifically refers to situations that can attract the students' attention, varying content that can move their interest and motivate them to engage in the lesson. This can become tiresome and demanding for the teacher, but relevant experience can provide with a productive solution.

"[...] You must try to be a little bit creative, and do something that really captures them, group-work, for example, or solve some assignments [...] It is just such things you experience eventually, even if you perhaps become a little bit discouraged. It happens of course, to

a teacher, it is the teacher's everyday." (9).

To sum up, the teacher refers to three kind of factors that can influence the effectiveness of the lesson, two concerning students and one concerning the teacher. With regard to the students, both uncontrollable –their aptitude- and controllable –amount of concentration paid- issues play a role. Besides, the teacher's experience and ability to respond to various situations is also essential.

Connecting the above to the issue of learning techniques, it is indicated that the teacher does not include them in the lesson, due to the reasons described above. The teacher feels external circumstances set limits to the amount of help she can provide, and thus uses to guide the students, as this is considered the most effective thing to do. She translates the students' weaknesses in a need to receive more individual guidance and instruction, and not a fact that calls for special training, i.e. learning techniques.

Commenting on the three teachers' descriptions of their role in helping the students manage, all show a great consideration for the students' abilities and level of proficiency. This is indicated either as the level of knowledge possessed, the presence of learning difficulties, the practical skills shown, or the amount of experience with the particular learning object. The teachers attribute a low quality of the above features to their students, and thus prioritise the ways that enable them to address the students at a more individual level. This special treatment is directed to an analytic way of teaching, to a more thorough presentation and explanation of the learning material, in the way that best suits the individual student.

In other words, the teachers address the students' low performance by altering their *way* of teaching, but not the *content* of what they teach. They do not employ any special learning and studying techniques that could enable students activate and reinforce their own capacity and abilities. Subsequently, it is implied that the students are not taught any techniques that contribute to the application of critical thinking. It seems that the teachers mostly support that being able to solve a working assignment and evaluating the factors given –i.e. critical thinking- is something achieved via practice, experimentation, and learning in that sense, and not via the development of personal thinking processes, assessment techniques, ways to independently weave together theoretical and practical considerations, or other relevant methods. Emphasis is paid on the learning process and not on the development of the individual's abilities and skills.

An exception to the above is the second teacher, who provides a kind of training which has the character of the aforementioned development, but not at a full extend. She does not

provide direct answers and solution to the students, but tries to make them discover it themselves by using a combination of theory-praxis.

In order to get a better overview of school 2, the experiences of the participants will now be presented in two groups, students and teachers.

The *students'* descriptions reveal that:

- The experience of critical thinking is connected to the nature of the subject. The students comprehend the phenomenon within the frame of their training, which includes mostly practical application. The students refer to the examination of working issues, evaluation of the work, discovery of the solution; those are seen in relation to the practical part of their training. In order to find the solution, the student has to examine the working object in praxis. The evaluation of the work involves also a test carried out physically on the car; the correct mode of action can be checked by for example setting the car in motion.

The same regards those students that identify critical thinking as an attitude of examination and scepticism to one's work. The consideration of the negative consequences involve assessment of the practical work, or of the hazards encountered in the workshop. The practical nature of the subject gives a practical nuance to the perception of critical thinking.

- Accordingly, the application of critical thinking involves not only mental activity, but also activity of the *body*. The students make use of various tools that they apply on the car in order to try out a solution, to check for example the extent of the damage. The examination of the problem involves 'seeing' if the car moves as it should, 'hearing' whether the engine sounds as it should, 'smelling' whether the exhaust pipe leaks.

Likewise, the consequences of working with a car can affect the body directly, as it might get dirty or harmed. The hazards in the workshop affect physically the body, by causing difficulties in breathing or even poisoning.

- The presence of the *others* is also indicated as the students co-operate in their effort to solve the working assignments. Evaluation of the situation and the proposed solution takes place under discussion. Critical thinking is not carried out in solitude.

Interestingly, while the presence of the other in the demonstration of critical thinking is indicated quite clearly under the perception of critical thinking, the same is not seen under the application of it. The students mostly describe the process of solving a problem as a solitary activity, where the student alone tries out solutions. The teacher of course contributes when asked, but no references to group-discussions for example, is made. Further investigation is necessary to clarify that point.

- Application of critical thinking also incorporates consequences for oneself. It can

lead to insight concerning both personal attributes and knowledge. Furthermore, it might initiate action, such as to take precaution measures.

- The demonstration of critical thinking depends on certain factors. The students name the school milieu and the teacher's attitude.

- Finally, it is indicated that the students do not receive any special training in techniques that contribute to the employment of critical thinking. They mostly execute the work rather than analysing it and discovering how to move along. Some exceptions are there, concerning the achievement of reading comprehension.

Concerning the *teachers*, the following observations are made:

- Their perception of critical thinking is context-dependent. Critical thinking involves evaluation of a working situation and the discovery of its practical solution. The teachers emphasise the importance of connecting theory and praxis, in order to be able to deal with the working situation. Critical thinking within their subject implies trying out in praxis the theoretical knowledge acquired.

An inquisitive attitude toward the information given is also mentioned, but at a secondary place.

- Likewise, the application of critical thinking is actualised by being involved physically with the working object, by assessing the extant problems with the help of examination of the car. The students have to try out in praxis various suggested solutions, so as to discover the correct one.

Moreover, the employment of critical thinking is done in relation to the *others*. The evaluation of the extant factors is carried out by discussing them with the other students or the other persons involved. The decision of what the problem consists of and what solution should be given to it, is a collective procedure.

- The teachers also signify the role of the *body* in critical thinking. The students use tools on the working object; the indicative factors examined are of such a nature that require from the students to touch, feel, see and hear, in order to discover what is wrong. The feedback that refers to bodily senses complements the mental activity –i.e. the application of the theoretical knowledge- and vice versa. Body and mind contribute to the demonstration of critical thinking in a harmonious synthesis.

- The teachers also refer to the fact that demonstration of critical thinking depends on certain factors. On the one hand, factors that can be *learnt* are mentioned: theoretical knowledge, experience and practice play a big role. They also signify the importance of the teaching technique used, as adjustment to the student's individual needs is necessary.

On the other hand, *uncontrollable* factors are also presented. The teachers believe that employment of critical thinking also depends on the presence of learning difficulties. Students that suffer from them are characterised by weaknesses both of a theoretical and practical nature, which do not allow them to apply critical thinking.

- Accordingly, training into critical thinking is almost totally absent. The teachers concentrate on promoting understanding of the learning material, by use of repeated explanations and further clarifications. They do not promote techniques that are directed to the employment of critical thinking, as the students' weaknesses make them prioritise other type of goals. Even though the opportunity to demonstrate critical thinking is ample, due to the subject's nature, it is doubted whether the students are engaged into it, as they lack the required skills and abilities.

The principal of School 2 is now added to the above.

Table 4.9. Constituents for principal, School 2 - Critical thinking

PERCEPTION	APPLICATION
<ul style="list-style-type: none"> ◆ Examination of information ◆ Discovery of solution ◆ Examination of working issues ◆ Evaluation of the instruction <p>It requires:</p> <ul style="list-style-type: none"> ◆ personal everyday experience ◆ knowledge of theory & the working object ◆ activity 	<ul style="list-style-type: none"> ◆ Solving work assignments <p>It depends on:</p> <ul style="list-style-type: none"> ◆ the students' level of training ◆ the students' degree of engagement ◆ the exam goals ◆ the presence/not of learning difficulties <p>It requires:</p> <ul style="list-style-type: none"> ◆ a favourable milieu

The principal describes four nuances of critical thinking.

Firstly, she refers to the examination of the information and knowledge acquired at school, meaning issues involved in the school subjects.

"[...] to produce conjectures and reason in relation to, but it is related to the subject, it is related to the pure, pure professional [...] it can be in relation to society questions, it can be in relation to profession questions." (23).

Specifically, the principal refers to the elaboration of information by examining it in comparison to personal knowledge and experience stemming also from everyday life. This aims to the investigation of the consistency found between the information and the analogous or similar 'real' situations. The truthfulness and correctness of the information can hence be decided, and further judgements can be made on it.

The principal indicates the above with the use of an example; meaning an assignment

where the students have to calculate the volume of a coffee mug, in other words to make an estimation about a familiar item from everyday life, with well-known properties.

"[...] A student shall for example calculate the volume of this here cup" (24).

The principal illustrates that the answer provided by the student is a number impossible to be true, considering the size and volume of the coffee mugs we use in reality.

"[...] he finds 300 litres" (25).

The above answer is regarded as a failure from the teacher's side, but not due to unsuccessful instruction on how to construct and execute the calculations involved. The failure consists in that the student is not capable of making this realisation, that the number s/he came up with cannot be found in reality.

"[...] Then we think that we as teachers have failed, because it is quite all right to calculate 300 litres in such a cup, it does not mean anything because it is only a number; but this, that they do not realise that you cannot put 300 litres in here, this has something to do with his ability to think and reason himself." (25).

The student, in other words, is not trained into making automatically a comparison of his/her answer and the analogous situation or item as met in everyday life. S/he is not able of incorporating the qualities of the item as found in reality, so as to give meaning to the numbers included in the problem. S/he failed to identify the inconsistency existing between his/her finding and the reality.

The principal further indicates that such a way of thinking and acting is actually expected by the students in all the school subjects. They should, in other words, be capable of elaborating the information acquired by using their knowledge and experience, so as to decide on its status, on whether it can be correct and true or not.

"[...] And this is the way we think within the subjects, that when we do a thing, either an arithmetical calculation or if it is a handiwork in the workshop, we shall make them to try to think logically in relation to what they do, and make conclusions themselves, and not take everything for granted." (25).

This type of elaboration implies certain requirements. As seen above, the students use experience from everyday life in order to assess the status of the information. Critical thinking, in other words, requires knowledge stemming from personal experience with the issue under scrutiny.

Secondly, critical thinking addresses the practical part of the students' training, the

working assignments they are carrying out.

"[...] I must relate this here [critical thinking] to for example the workshop, where most of the training takes place." (26).

This refers specifically to the production of judgements concerning working tasks, meaning the examination and assessment of the extant indicative factors, so as to discover the origin, nature and location of the problem detected on the work object. The principal underlines that it is widely acknowledged in this profession area, that this process is the most essential task the students are trained in; the core of their education consists in them learning how to execute such assignments.

"And we repeat it, many times, we hear it from the branch we educate people for, that the most difficult and important area has become with the modern technique, it is the search for the source of the problem [...] (29) [...] all the training is directed toward making the students to make their own assessments (26) [...] all the training addresses that, this is the goal, it is included in the subject syllabuses also, it is actually part of most of the goals there, that the students should be able to carry out different things" (26).

The above process includes the assessment of indicative factors. Those might be own observations and/or observations from others. The principal refers to the case of having the customer, the owner of the car, coming to the workshop and describing the symptoms s/he has experienced. The presence of the *other*, is thus an essential part of the elaboration the student has to execute, the other is a valuable source of information, presumably also a discussion partner for the problem involved.

"[...] Imagine when a car comes to a workshop. What we wish the students are competent with when they are finished here, is that when they talk with a customer, they get some concepts, a customer could say that 'OK, there is something that rumbles when I drive at 30 miles per hour.'" (26).

The student, thus has to consider the indications received from others, and use his/her own corresponding knowledge, examine the object on his/her own and combine all these together into a picture that makes sense for the given situation.

"Our aim is that after the student has talked to the customer, when he starts on a car, to be able of using his professional knowledge so as to make an own evaluation of what it is that is wrong with this car here." (26).

In other words, the student must make connections between the theoretical knowledge and the situation as it is in praxis. S/he must identify the appropriate theory applying at the present situation, and find the way to transform it into practice.

"[...] to be able to use this knowledge he has to reason in relation to what he is doing" (26).

The application of theoretical knowledge, thus, leads to the discovery of the problem, to the production of own judgements regarding the source and location of the problem. It is this combination of theory-praxis that enables the student to make decisions.

"[...] a good problem-seeker, he is very competent with making own conclusions, to use his professional knowledge [...]" (29).

The principal emphasises this point by illustrating the significance of being able to make theory into practice. The comprehension and elaboration of knowledge at the pure theoretical level does not suffice for this kind of training. The student is expected to develop the ability and skills required so as to make use of this knowledge in a practical assignment, here in the discovery of the problem the car has.

"[...] this is the whole aim, one thing is the professional knowledge we shall fill up with, you can fill up with very much knowledge, but if they are not capable of converting that knowledge so as to use it to that critical thinking to make conclusions, then they have no use for the professional knowledge. It is wrong to say that they do not have use for, but they do not make the various professional knowledge useful." (27).

The principal elaborates further what this process of discovery consists of. It includes use of various types of knowledge, that pertain to various sub-areas regarding the subject, and identification of those relevant to the situation parts. Specifically, the working object comprises of separate parts that regard various systems; these have different properties, follow different rules, are of a different nature. Those all co-operate together into a synthesised unit. Accordingly, a symptom of a problem asks for investigation and assessment of elements belonging to more than one of those sub-systems. One must possess knowledge about all the various parts, must know the object both as separate units and as one entity. Hence, the discovery of the malfunction's source could be done either by examining those systems one by one and eliminating the ones not involved, or by considering possible connections between the systems, and move gradually through them. In other words, familiarity with one isolated part only, is not enough for the identification of the problem; a synthesised way of proceeding is necessary.

The principal gives a specific example of a car and how it works.

"[...] a car is put together by many different systems –you have electric systems, hydraulic systems, you have mechanical systems– and all those systems function in a co-operation, so it is obvious that a condition in one part, one system, leads to something in another

system, and this is what we wish, that the students be able to find out."
(28).

Moreover, the discovery of the problem's cause involves not only intellectual elaboration of the facts given, but also *physical*. The principal indicates that the symptoms the students have to examine refer to bodily senses, such as hearing an unusual sound or not getting the reaction expected from the car. Part of the examination process includes use of those bodily senses, in both the detection of the problem's location, and the checking of the action taken.

"When you talk with a customer, he says, actually hears something strange, or the car behaves strangely." (38).

Similar situations might ask for participation of various kinds of senses; the students can 'hear' where and what is wrong, can 'smell' if something is burnt, or too much fluid of some kind is used, can naturally 'see' fluids leaking, parts hanging, and also 'touch' and move various parts to feel whether they are loose, warm, etc. The feedback one gets from such bodily signals is of a great significance for the identification and solution of a working problem.

Hence, the second type of critical thinking embraces the identification of a working problem, based on one's own observations and intellectual elaboration, in relation to indicative factors and theoretical knowledge. The role of the other and the body is essential in that process.

Thirdly, critical thinking refers to another type of assessment, which does not regard the working object per se, but one's own actions. The student has to examine the tools and means used, the individual actions taken, by considering possible consequences and effects.

"[...] when we are in the workshop with the students and we work with details of a safety character, so we wish that they shall be critical, assess all the time. So that they evaluate what they themselves do, would he send out a car that lost the wheel out here –it has actually happened one time and it is not quite pleasant- it regards, in relation to the work, the work they do." (11).

The principal thus indicates the students have to show autonomy and independence, in assessing the circumstances and elements involved when performing actions in practice. In other words, critical thinking involves responsibility for the consequences of one's actions, both over oneself and over the others.

Fourth, critical thinking includes the evaluation of the instruction provided. The principal mentions that the students are expected to examine and express an opinion about the

type of learning and teaching techniques used, the way the lessons are carried out. They should judge whether the instruction is beneficial for them or not.

"We wish them to be critical in relation to the offer of training that they get. We wish that they shall be more critical to that." (12).

To sum up, critical thinking includes the examination of the information acquired in relation to one's personal knowledge, the assessment of working problems and the discovery of their solution, the examination of the consequences of one's actions, and the evaluation of the instruction received.

Accordingly, the principal indicates that critical thinking depends on certain factors; as seen before, the presence of everyday experience and theoretical knowledge on the issue under investigation, as well as familiarity with the working object are requisite.

However, the initial engagement into critical thinking presupposes a level of activity from the students, they have to be willing to and prepared to participate into a process of elaborating information.

"[...] they [the students] are used to sitting on the school bench through very many years and receiving very much. So if they shall develop a critical sense, make own judgements, one has to be active, there must be something going on here [shows her head]." (10).

The students thus have to be ready to engage into mental activity, to show some alertness and will to examine the knowledge received.

With regard to the *application* of critical thinking, the principal focuses on the pure practical work. She initially underlines that all the training the students get addresses this issue, especially the practical part, meaning the execution of practical assignments.

"[...] all the training is directed toward getting the students to carry out evaluations on their own...I must relate this here to for example the workshop where most of the training takes place." (26).

Specifically, the students are responsible for solving working assignments of a pure practical character, in order to learn their profession. They examine the working object directly, consider the indicative factors and try to discover the solution to the problem detected. The nature of the training, in other words, asks for the execution of work assignments where critical thinking is constantly applied, in the sense of making own judgements regarding the working situation.

"They train in that way that they get, they have a more problem-based learning, where they get assignments [...] the student gets a job, where there is some indication of a problem, and he shall try himself to find it, what it is he shall do." (30).

The students get the opportunity to carry out a working assignment by dealing with all the phases of its execution on their own, meaning from the detection and identification of the malfunction, to the discovery of the appropriate solution. The principal explains the students receive a basic amount of information regarding the working object, and are in charge of carrying out the work on their own.

"[...] when he [the student] starts to work with own vehicle in the workshop, the customer can stand out in the yard here and say to him that 'my car pulls to the left when I brake'. And then it is the student who has to find out what the problem is [...]" (31).

However, the principal explains that not all the students assume such a responsibility. The type of assignments given depend on the level of the student, meaning the amount of knowledge and degree of experience possessed. The lower the class, the less demanding the assignments are, in the sense that the student does not have to deal with all the phases of the working process. The identification and location of the exact malfunction, for example, is something that comes later in one's education, as it requires a higher level of experience. The beginners are limited to the direct execution of an action, and eventually to the discovery of the solution for a given problem.

"[...] we don't begin like that [see unit 31 above] with students when we are supposed to give them the total basic, then we don't do like that (31) [...] it will be a progression from the teacher's side, because in the beginning of the school year, perhaps especially those who don't have any knowledge of the car, then they will be guided rather strongly in relation to what they should do, they get the instructions to do this and this and this. But it decreases, and the work will be more complicated, gradually. (34) [...] when they arrive later in the school year, then they get a bigger responsibility in relation to a bigger part of a job that comes." (35).

Thus, it is indicated that in the beginning the students are mostly executors, they apply in practice what is learn in theory, under the teacher's close guidance.

Besides being engaged into a working assignment, the students have the opportunity to demonstrate critical thinking also due to the nature of the working object. Specifically, the discovery of the solution to a malfunction is not a process always determined beforehand. The extant factors and indications have to be considered every time in relation to the present situation. As seen before, the working object is a synthesis of various units; the same indication might signify problems in different parts each time. Besides, new ways of solving problems might arise constantly, as the objects' parts develop with the production of new technology.

"[...] reparation of very often a problem-based learning. Because the

answer is open to the situation, so it is not certain that the teacher can give the answer, because nowadays there happen quite many new things, that not even the teacher has an overview over every time." (33).

Critical thinking hence, is applied as the working assignments the students deal with, cannot be solved with the execution of a static process, but require assessment of the extant situation, and integration of old knowledge with new one.

Furthermore, the demonstration of critical thinking depends on certain factors.

As seen above, the beginners are not engaged into complicated assignments, as they lack the necessary knowledge and experience. Subsequently, certain abilities are required so as to deal with the discovery of both the problem and the solution.

"It is obvious that [...] we give them [the students] assignments that are limited, which one of them they need to have, which abilities they require in relation to that with critical thinking in the beginning of the school year." (35).

In other words, critical thinking cannot be demonstrated when certain abilities are absent, abilities which can however be learnt or acquired as the level of subject knowledge and experience with the working object increases.

At the same time, a particular degree of engagement is necessary. The student should make sure s/he pays the necessary effort and uses an amount of forces into working with his/her skills and abilities. In other words, a will to learn and participate actively in the working assignments is requisite.

"[...] here there is something expected from the students also [...] the student must initially be very interested." (18).

Hence, critical thinking presupposes an attitude of interest and enthusiasm regarding the learning process. The principal explains that this is influenced by certain circumstances. The level of previous school performance, namely, determines the student's will to learn, as low performance has a negative effect on one's way of evaluating oneself. The not so successful student, in other words, builds up a picture of him/herself as not being very competent at school, as failing most of the times. Those negative feelings elicit a hesitation to attend school and engage into the learning process, as more failure is anticipated. The student does not have many positive things to expect from school anymore, and becomes thus passive.

"And we are quite sure of, this has something to do with previous school past, because the students who are engaged into the school society, who are critical, it is those who, from an evaluation point of view, have had the best results in the youth school. So the students

who have been school losers in youth school, they struggle with their self-image. They struggle extremely with the absence problematic, among others, they do not take responsibility for themselves and this goes together with the things we have here [...]" (13).

Parallely, the student should get incentives for the demonstration of critical thinking from a favourable milieu. The school and the teachers should ensure the presence of opportunities appropriate to the execution of practical assignments and the relevant circumstances for critical thinking to take place.

"[...] the school shall provide the students with the opportunity, and we shall [...] develop the student further [...]" (18).

In addition, the application of critical thinking depends on the type of the exam goals set. As the principal emphasises, the school accommodates the instruction and training of the students to the syllabuses' goals.

"[...] to get in the learning goals that are included in our subject syllabuses, as it is them they will be tried on [...]" (40).

Training into critical thinking is not part of those goals; consequently, the teachers do not concentrate on its development and promotion.

"[...] and we must remember that, the core curriculum will not be run a final test on at all, they do not get a grade on that, it is not included in the exams either. So it is the subject specific goals [...]" (40).

In other words, as critical thinking is something present in the core curriculum and is thus not an object of exams, the school does not prioritise it.

Related to this is the final factor the application of critical thinking depends on, namely the presence or not of learning difficulties. What dictates the focus on other goals, rather than critical thinking, is the fact that the students have certain weaknesses that require intensive training of another kind.

The principal supports that the rules governing the educational system make it so that the majority of the students attending her school have such a low school competence, that they struggle with the execution of primary tasks, such as reading and comprehending a text, or writing. This refers specifically to the law which allows the students who suffer from learning difficulties to apply first at their school of preference, and be prioritised with regard to the school admittance.

"The admittance to the upper secondary school occurs in various rounds. On the 1st of February, all the students with documented learning difficulties apply, in other words they are students who have a strong degree of reading and writing difficulties, students who have

social backgrounds that account for them not applying under an ordinary basis, so very many students that would not have been admitted in the school originally, had they competed on an equal basis. [...] And then there is an ordinary application in the spring, where the rest of the students get a place. Because the 'a-applicants' get a place first." (14).

The application of the above rule results in that the school consists mainly of students who face considerable difficulties in carrying out the assignments posed and in fulfilling the goals set. The principal explains that they lack the required aptitudes, partly because they have not followed the usual school progress. Due to their difficulties, they have been exempted from some subjects in their previous schooling, and are thus not prepared properly, as they did not develop and train all the necessary abilities and skills.

"[...] they can be disqualified. (14) [...] In the foundation courses in the mechanical subjects this year we have two classes, and there are 24 students altogether. There are 15 a-students who applied at us. It is not possible to take in all, but 15 a-students, that means students who will not go through the curriculum in a complete sense, because they do not have the qualifications, they have been excused from subjects in the foundation school." (15).

In addition to the above, the students who suffer from learning difficulties are not bound to demonstrate critical thinking also because they lack a corresponding requirement, namely the attitude of will and enthusiasm to attend the lessons. As the principal indicates, those students do not always choose the particular education based on personal preferences. Rather, their school weaknesses do not allow them to attend another educational direction, for example AA, as due to the high demands, they would not manage to fulfil it. The mechanical subjects are more attainable, as they do not require strong reading and similar theoretical skills; they involve practical assignments, which are considered easier to deal with. The skills and abilities seem easier to master, as well as of more fascinating nature that can maintain one's interest. The principal underlines that the above is mostly suggested not from the students themselves, but from their consultants in their earlier schooling. They see mechanical subjects as the most probable education those students can succeed in.

"And I believe that one of the reasons why we have a much bigger part of weak students now, is actually the problems that the consultants in lower secondary school have. They sit face to face with a student who has failed in English, has failed in Norwegian, and perhaps also in mathematics. What shall he advise this student to do? Shall he advise him to take AA? Then one is quite certain that he is perhaps going to fail there as well. I would advise them to take mechanical subjects, as then he is allowed to screw, and car, it is exciting for the youth" (17).

The above implies two things. On the one hand, the student is forced by the circumstances to attend this type of education, without necessarily liking it. Hence, s/he does not attend school with a high degree of will and determination to fulfil it, but rather as an unavoidable thing s/he has to do, in order to get an education and be able to find a job later. On the other hand, the student has already formed certain expectations for the requirements of this education, due to what s/he has been told by the consultants. As the latter contrast the degree of difficulty between AA and ME, the student is left with the impression that ME is not particularly demanding. The student is thus inclined to pay a small amount of effort, s/he is not prepared to face any particular problems with the training. Thus, when faced with the school reality, the student is met with the same situation of failure once again, something that makes him/her lose enthusiasm for school and feel unable to make it through.

The principal herself acknowledges the fact that not all students are guaranteed to succeed.

"[...] it is not certain that all will reach the goal, it is not certain that they will all fulfil their profession education." (16).

In other words, the reason why the presence of learning difficulties hinders the demonstration of critical thinking is twofold. Firstly, the students who suffer from them do not possess abilities, skills and knowledge at the required degree. Secondly, their low school performance 'forces' them to make educational choices that might not be embraced with enthusiasm, and might lead to frustration regarding the students' chances to succeed.

To sum up, the application of critical thinking depends on the presence of certain abilities and of an active engagement into the learning process, on the appropriate incentives provided by a favourable milieu and corresponding exam goals, and on the presence of learning difficulties, which influences the level of competency and attitude assumed.

Finally, the principal observes that the application of critical thinking can be detected quite easily, as the students who do not make use of it are unable of carrying out the given assignments. Critical thinking, in other words, is a necessary factor for the execution of one's work.

"[...] that will reveal itself quite fast, in relation to this type of work, because a student who is not capable of it [critical thinking] at a particular degree, he will be standing there, he will not get done anything considerable." (34).

What follows now, is a comparison of the principal's experience with the rest of the participants from School 2.

Table 4.10. Constituents for all participants, School 2 - Critical thinking

	PERCEPTION	APPLICATION
Principal	<ul style="list-style-type: none"> ◆ Examination of information ◆ Discovery of a solution ◆ Examination of working issues ◆ Evaluation of the instruction It requires: <ul style="list-style-type: none"> ◆ personal everyday experience ◆ knowledge of theory & the working object ◆ activity 	<ul style="list-style-type: none"> ◆ Solving work assignments It depends on: <ul style="list-style-type: none"> ◆ the student's level of training ◆ the students' degree of engagement ◆ the exam goals ◆ the presence/not of learning difficulties It requires: <ul style="list-style-type: none"> ◆ a favourable milieu
Student 1 (M)	<ul style="list-style-type: none"> ◆ Personal utterances on profession ◆ Self-evaluation of work It requires: <ul style="list-style-type: none"> ◆ personal interest It contributes to: <ul style="list-style-type: none"> ◆ personal insight 	<ul style="list-style-type: none"> ◆ Not particularly encouraged ◆ Only in specific situations
Student 2 (M)	Examination of the consequences of one's studying choice	
Student 3 (M)	Solving a working problem	Left to work on their own
Student 4 (M)	Unknown term	Unknown term
Student 5 (M)	Considering the potential hazards at work	Taking action regarding the potential working hazards
Teacher 1	<ul style="list-style-type: none"> ◆ Common understanding ◆ Various working ways, same result ◆ Evaluation of the teaching/learning method ◆ Attitude of scepticism toward the learning material It requires: <ul style="list-style-type: none"> ◆ experience ◆ practice 	<ul style="list-style-type: none"> ◆ Acquisition of experience ◆ Assessment of learning process & methods It is enabled by: <ul style="list-style-type: none"> ◆ the teacher's techniques It has been developed in the earlier school years
Teacher 2	<ul style="list-style-type: none"> ◆ Correct action based on external criteria It requires: <ul style="list-style-type: none"> ◆ experience 	<ul style="list-style-type: none"> ◆ Evaluation of the working situations It depends on: <ul style="list-style-type: none"> ◆ the presence/not of learning difficulties ◆ teacher's techniques
Teacher 3	<ul style="list-style-type: none"> ◆ Evaluation of the working situation ◆ Choice of correct action It requires: <ul style="list-style-type: none"> ◆ theoretical knowledge ◆ experience ◆ understanding of the factors 	Solve on their own working assignments

Firstly, the principal is in total agreement with the teachers concerning the perception of critical thinking. Her descriptions incorporate in an overview manner what the teachers experience; examination of information, assessment of the working tasks by considering indicative factors, discovery of a solution. They all emphasise the connection between theory and praxis, as the main axis around which critical thinking is employed. However, the principal refers more extensively also to the use of everyday knowledge, so as to check the

truthfulness of the information, something that the teachers do not include. She does not, in other words, concentrate only on the practical application of the theory, but views critical thinking in a more spherical manner.

Some common experiences are also found between the principal and the students; the elaboration of information and the discovery of a solution, or even the consideration of safety matters, which refers to what the principal described as the examination of one's actions and working environment. However, the students seem to be very little familiar with the phenomenon, and have thus a less elaborated apprehension than the others'. This is particularly seen with student 4, to whom critical thinking is totally unknown.

When it comes to the requirements of critical thinking, the teacher and the principal have again similar experiences. They all emphasise the role of experience and theoretical knowledge, the necessity of practice. The principal, however, identifies some additional factors, like the attitude of interest for school and will to learn. This is also indicated by the first student, but otherwise the students do not acknowledge any other requirements.

Two constituents are present in almost all the experiences; the presence of the *other* and the role of the *body*. The participants acknowledge critical thinking employs the contribution of the other, either as a source of information, or as a discussion partner. The objectives are achieved through co-operation with others. Besides, critical thinking is not a sole mental activity; the students use their physical, bodily senses, in order to identify the source of the problem and its solution. The nature of their training dictates the participation of the body.

Regarding the application of critical thinking, both the teachers and the principal emphasise the connection between theory and praxis, that the assignments the students deal with, are of this type. However, deeper investigation revealed that not all the students actually apply critical thinking; this is determined by the level of their training. During the first years, the students are mainly executing instructions, and are concentrated mostly on the pair try-fail. Both the teachers and the principal indicate that, when referring in details to the content of the work, or to the type of help the students receive. Only later on in one's education assignments that ask for deeper elaboration and discovery of problems and solutions take place. The students seem to agree with the above, as they declare not experiencing any circumstances where critical thinking can be applied. Even in the case of student 3 and 5 who answer positively, a careful examination of their description does not reveal this with certainty.

Besides, both the principal and the teachers acknowledge that they do not focus on this

area; they might provide the chance to demonstrate critical thinking, but with no further guarantee that it is actually applied. This is also clearly seen in the discrepancy between the principal's description of the students' assessing indicative factors in order to solve the problems, and the students mentioning that they usually ask the teacher for advice when difficulties are faced. In other words, only the opportunity is given.

The most noticeable difference is found when the requirements for the application of critical thinking are examined. The students refer to the importance of having a favourable milieu, of the school providing the appropriate opportunities. The teachers and the principal, however, mostly refer to the students' school performance, to their competence level regarding abilities and skills, as well as their attitude toward learning. All of them refer to the fact that the students suffer from learning difficulties, and how this counteracts the achievement of the curricula goals, and consequently the employment of critical thinking. They describe how they accommodate their teaching accordingly, meaning the make use of techniques that address the students at a more individual level. Hence, they alter not the content of the instruction, but the way of carrying it out. In other words, the students attribute mostly contextual factors to the application of critical thinking, whereas the teachers and the principal factors related to the students.

It should be finally mentioned that even though the teachers and the principal recognise the importance of critical thinking in the students' training, they acknowledge at the same time the minimal attention paid to it at school. The teachers believe it was an object of education in the students' previous schooling, the principal mentions they have to prioritise the exams goals, which do not include it. This is reflected on the students, as they are basically not familiar with it, given both the difficulties faced when trying to elaborate it, and the absence of its application.

After the above overview of School 2 regarding the perception and application of critical thinking, the principal's descriptions of *learning strategies* are presented.

Table 4.11. Constituents for principal, School 2 - Learning strategies

TIME	CONTENT	VALUE
<ul style="list-style-type: none"> ◆ Mainly during 1st year ◆ Repetition later up to the individual teachers. 	<ul style="list-style-type: none"> ◆ Closely related to the working object Directed toward: ◆ extracting meaning 	<ul style="list-style-type: none"> ◆ Help students deal with demands of the future working life

Initially, the principal explains that the theoretical part of the students' training is very limited. The school has reduced the amount of theory the students have to go through to the

absolutely necessary, due to the problems the students have, i.e. they suffer from learning difficulties.

"[...] we have both AA and subjects of studying directions. For our student group, we [...] have come to the almost unambiguous conclusion that whatever we can omit from theory, we will omit it. (39) [...] and eventually, we have at the smallest possible degree theory. Exactly because we know that there are so many students that do not understand what they read." (41).

This implies that the way to deal with theory is not a primary focus. The main concern is to manage to execute assignments in praxis, which composes the frame of the students' training. Hence, the school accommodates the instruction on learning techniques to the achievement of the above. Specifically, they concentrate on texts which are directly referring to working matters, and are an indispensable part of one's work. The techniques learnt refer to how one can make out the meaning of such a text; first to read it and then to form an understanding of it.

"[...] it is how they shall go through a text. Because the point with us to go through a text, is not the way most of the subjects [follow], now I don't talk about literature, not about orthography, or mathematics, but what most of them need to learn and what we shall teach them to read, is what is found in the working shop handbooks. Because this is what they meet when they come out on the workshop." (42).

The studying techniques, thus, are totally directed toward the pure practical needs involved in the working life, they address those skills and abilities participating in the execution of practical assignments, which the student has immediate use for.

Specifically, the students are given a text which contains information on an issue regarding the working subject, which they are bound to deal with in a real working situation. Their task is to read through it and try to understand its content. The teachers check this understanding by asking the students to describe what they read.

"What we try to make them understand, is what a small paragraph includes, they get to read a small paragraph which is a description either of a condition on a car, or of a wear and tear, in other words a description of a technical thing. What we often do for them, is that when they read through such paragraphs, we get them separately later and ask them to tell us 'what is it you have read now'." (43).

In case that the students are not able of presenting what they read, the teachers do not give direct answers, but try to make them elaborate things themselves, help them to uncover the meaning of the text on their own.

"Some are not so competent in explaining themselves, actually, we get them to think, what is it this paragraph shows." (44).

Accordingly, the objective with writing is not to manage the technical aspects of it, such as orthography or handwriting, but the content, whether it conveys understanding from the student's side. This is the essential part of the training, as the theoretical knowledge will be transformed into praxis; without understanding the written text, the student is unable to deal with practical assignments.

"[...] when they write, it is not so important for us neither their orthography, nor how the handwriting is. But it is this with understanding, that we put a lot of weight on. That they will understand what they read, to translate what the individual teacher gives to the students [...]" (44).

The principal specifies the above take place during a short period in the beginning of the foundation courses year. She does not support the application of a longer course, as the main goal is to manage to go through the practical assignments, to start working in practice. The time spent on theoretical issues should thus be limited considerably, and adjusted to the practical ones.

"[...] we do not have any special project except a short introduction in some studying techniques in the autumn [...] it is not a complete course, it is just some hours during the autumn. [...] in the beginning, yes. The fewer hours we sit together with the students on the desk, the better it is. Our departing point is that we shall work with the practical, and then we go to the theory room when we need to do so. Next year, we will also move part of the AA out to the workshop." (45).

Apart from that, it is up to the teachers whether they will deal with such techniques in their lessons, or not.

"We don't take any special activities in relation to the students, beside the individual teacher." (47).

The principal adds that the prioritising of understanding and applying theory in praxis is in accordance with the goals of the syllabuses. The students are expected to be capable of performing acts, and not of describing them. The execution of an assignment is the final goal, and this is what determines the way to learn, which is chiefly through praxis.

"[...] Reading is not the most important thing for us. Because most of the goals in the curriculum concern to execute things, it is not so important that you shall say things, but it is important that you can do it. This is most of the goals. We have had mute students here, and those who are actually so word-blind that they cannot read, so if they we teach them in that practical way, then this is actually the important thing for us." (46).

Besides, the nature of the work is another factor that determines the amount of time

spent on reading. The principal explains that the students have a rather demanding everyday, with a lot of physical, practical work, which requires considerable amounts of effort. The students do not have much energy left otherwise, to spend on reading and trying to understand the written text. That would actually counteract the achievement of the everyday goals. Hence, the hours devoted to reading are very few, and get more intensified before the exams, for obvious reasons.

"[...] We had a survey [...] how much time our students use on reading homework, out students use on average from zero to half an hour per week on reading homework, because they read very little. There are some who read quite more in periods before tests and so on. But as an average, this is what I believe, when the students have a long working day –they start 08.00 and finish 15.30, this is a usual working day- if they do their job during that time, then they manage to reach the goal, when they don't have so much in the evening." (47).

The above implies that the students receive no training with regard to techniques related to critical thinking. The focus on understanding the theory does not equal successful use of it under the assessment of a working problem, for example. The principal acknowledges the significance of being able to apply the theory in praxis, but the ability to understand the theory does not ensure that.

Let us then examine the principal's descriptions with regard to the training the students receive, focusing on their techniques and the teachers' role. As seen also above, the instruction takes place mostly in a practical way, where the students receive an assignment and have to deal with it. The principal specifies the teachers do not point out the actions needed to be taken, but let the student decide what needs to be done.

"They train in that way that they get, they have a more problem-based learning, where they get assignments, in other words the teacher does not say to the student that 'OK, now you will unscrew this wheel here, and then you will take off this part of the break there, and then you will change', but the student gets a job, where there is some indication of a problem, and he shall try himself to find it, what it is he shall do." (30).

The teachers, in other words, do not instruct directly the students on how to proceed, but expect them to consider the indicative factors and make decisions regarding the given assignment. The teacher helps the students in that process by guiding them through.

"[...] the teacher will not tell it [the problem] to him [the student]. But the teacher is present all the time so that he can guide, and that he [the student] can ask the teacher." (32).

This role the teacher assumes, implies the presence of a technique where the student arrives at own conclusions autonomously, as s/he is not given clear instructions on what to do,

but is helped to discover it by own thoughts and actions. However, the way the students are trained into synthesising for example the various indicative factors, meaning *how* to perform this process of discovery, is not shown. What the principal describes is circumstances and situations where can be used as *opportunities* to apply critical thinking, with the teacher having a guide role. The actual skills and abilities necessary to achieve that, though, are not an object of training. This is indicated when the principal elaborates the type of assignments given to the students, according to their proficiency. It is implied that only those attending the last years of education have full responsibility for the process described above. The other students are mainly executors, who follow the teachers' instructions and get immediate help from them when asked.

Hence, the above signifies that the students do not receive any special training in techniques that would enable them to demonstrate critical thinking. They are given opportunities, without though being prepared to use them effectively. This regards also the other aspects of critical thinking the principal described. No technique addressing the examination of the information in comparison to knowledge from everyday life, is indicated.

A comparison of the other participants' experiences to the above, reinforces the aforementioned observations.

Table 4.12. Constituents for all participants, School 2 - Learning strategies

	TIME	CONTENT	VALUE
Principal	<ul style="list-style-type: none"> ◆ Mainly during 1st year ◆ Repetition later up to the individual teachers. 	<ul style="list-style-type: none"> ◆ Closely related to the working object Directed toward: ◆ extracting meaning 	<ul style="list-style-type: none"> ◆ Help students deal with demands of the future working life
	STUDENTS	TEACHERS	
Student 1 (Male)	<ul style="list-style-type: none"> ◆ Read slowly many times ◆ Find meaning 	<ul style="list-style-type: none"> ◆ Read slowly many times, find meaning ◆ Guide the students to find answers 	
Student 2 (Male)	<ul style="list-style-type: none"> ◆ Read through textbooks ◆ Emphasis on particular parts 	<ul style="list-style-type: none"> ◆ Points out which parts to study ◆ Gives the area the exam will be in 	
Student 3 (Male)	<ul style="list-style-type: none"> ◆ Comprehension of assignment ◆ Trying out in practice theoretical considerations ◆ Audio tapes and notes of lectures 	<ul style="list-style-type: none"> Gives answers to extant and potential working problems 	
Student 4 (Male)	<ul style="list-style-type: none"> ◆ Reading of the textbook ◆ Notes of essential parts 	<ul style="list-style-type: none"> ◆ No help, only provision of knowledge 	
Student 5 (Male)	<ul style="list-style-type: none"> ◆ Studying in a quiet environment ◆ Keeps notes 	<ul style="list-style-type: none"> ◆ Study in quite environment ◆ Further explanation of unclear points 	
Teacher 1	<ul style="list-style-type: none"> ◆ Individual & group-work ◆ Observing student-models 	<ul style="list-style-type: none"> Individual learning techniques 	
Teacher 2	<ul style="list-style-type: none"> ◆ Understanding theory-practice ◆ Repetition 	<ul style="list-style-type: none"> ◆ Individual help: clarification ◆ Exchange theory-practice 	
Teacher 3	<ul style="list-style-type: none"> ◆ Review of previous exam ◆ Self-assessment 	<ul style="list-style-type: none"> ◆ Guides how to proceed Limitations due to: ◆ time restrictions ◆ class structure 	

The principal's main preoccupation with helping the students understand the written text, is also present at the other participants' descriptions. As seen above, the students concentrate on techniques that enable comprehension, meaning ways to extract the main points out of the text, keeping notes, controlling the reading environment. The teachers emphasise the significance of understanding the connection between theory and praxis, and try to address the students at an individual level, so as to enhance understanding.

Moreover, even though the principal presents the teacher's role as that of a guide, the students' and teachers' descriptions signify something different. The students mention asking directly the teacher for help, who either provides further clarifications, explains difficult points, or indicates what to do, actions that are included in both the students' and the teachers' experiences.

Consequently, it is suggested by all the participants' descriptions that the students do not receive particular training into techniques related to the demonstration of critical thinking. The opportunities are given, due to the nature of both the instruction and the working object, but the skills and abilities necessary to make use of them are not promoted. Both the principal and the teachers provide explanations for this, mainly by referring to the students' level of proficiency, presence of learning difficulties, and to the demands posed by the exam goals.

As seen also above, it ends up to be more a matter of trying-out-and-failing type of learning, instead of a training where the skills and abilities to come to own judgements takes place right from the beginning.

4.1.1.3. Summary of the section

So far, the descriptions on critical thinking and learning strategies of all the participants from the two schools have been analysed. Each school has been presented by comparing the various groups with each other, students, teachers, and principal. The perception and application of critical thinking have been elaborated, together with the role of learning techniques in critical thinking demonstration.

What follows is a parallel examination of School 1 and School 2.

4.1.2 Critical thinking –the two school cultures

The comparison of the two schools is directed at the examination of the role the context has on the perception and application of critical thinking. The two principals are examined, focusing on their role in the school and what I call the 'school culture'. The latter includes particular programs, actions, and attitudes which are related to the perception and

application of critical thinking as described by the participants. The aim is to investigate whether and in what way those factors interact and influence the phenomenon in the school reality. The role of the contextual factors, in other words, is being discussed.

Accordingly, the principals from the two schools are first presented with regard to their role and school culture. School 1 and School 2 are then compared to each other by direct reference to those contextual influences.

4.1.2.1. The principals of the two schools

Table 4.13. Constituents for principals, School 1 & 2 – Role and School Culture

	PRINCIPAL'S ROLE	SCHOOL CULTURE
School 1	<ul style="list-style-type: none"> ◆ She is teaching herself ◆ Close co-operation with teachers 	<ul style="list-style-type: none"> ◆ Especially appointed persons for close contact with teachers & students ◆ Teachers free to design lessons ◆ Teachers co-operate ◆ Especially designed programmes ◆ Student seen as a whole ◆ No different student-teacher status ◆ Problems with AA in applying the core curriculum
School 2	<ul style="list-style-type: none"> ◆ Does not teach herself ◆ Not in close contact with the students ◆ Co-operation with the staff 	<ul style="list-style-type: none"> ◆ The general curriculum includes description of instruction content ◆ Especially appointed persons in close contact with teachers ◆ Opportunity for the students to participate in the instruction design ◆ Some teachers are not educated pedagogues ◆ A lot of the students with low school performance/ learning difficulties ◆ Main goal to increase students' enthusiasm ◆ Priority of practice

Starting with the principal from *School 1*, it should be first mentioned that she is teaching herself.

"[...] I just gave an assignment myself to a class here [...]" (41).

Secondly, the principal tries to maintain a close co-operation with the teachers. She feels that one of her main duties is to take the appropriate actions so that the various goals and guidelines included in the core curriculum and syllabuses are followed; a way to achieve that, is by being in direct contact with the teachers.

"I believe that what is included in the curricula should be applied, [...] and I, as principal, I must ensure in the best possible way that what is included in the curricula is actually applied. It can be in various ways, among others by talking with the teacher [...]" (4).

The principal indicates she carries out discussions with all the teachers in the school, in rather frequent periods. As she has not been working in that school for very long, she considers these personal contacts as the basis for a further communication, as the foundation for her co-operation with the school members.

"[...] I have actually talked with all the teachers here at school twice since I began here, two and a half years ago, it is in a way a beginning phase, it is something you do to start with." (4).

The establishment of a relationship to the teachers is thus considered essential for the realisation of the principal's role. Close contact with them enables the fulfilment of the goals set in the core curriculum. This is particularly indicated when the principal discusses critical thinking, and the aforementioned difficulty met with AA. She acknowledges that part of the reason why critical thinking is not fully applied there, is due to the lack of this close contact between her and the teachers of AA. The principal does not have a full overview of the way those teachers carry out the lesson, or perhaps the problems faced with applying the guidelines given; they have not had intensive discussions on possible ways of dealing with them.

"So it is important for us, and especially in AA studying direction [...] the biggest problem in relation to apply this type of thinking here, we are especially bad at it. There is a bit too long distance from the principal to the individual teacher, when it comes to follow up, ensure that this here is done in a good way." (4).

However –and this leads us to the school culture- the principal still makes sure the teachers are not left on their own, in those cases where she cannot personally maintain such a close contact. Certain persons are especially appointed to maintain direct communication with the teachers. Their function is part of the new milieu the principal tries to establish at school, meaning a system of support and guidance regarding the achievement of the curriculum goals. The principal wishes to provide the means necessary for the teachers to carry out the demands of their new role.

"[...] Right now, we work with introducing a new leader culture here at school, because it is important to me that we have a lot of leaders who are close to the teachers, so that the 'moment of truth' regarding the transmission of this type of knowledge is what happens in the meeting between the student and the teachers [...]" (1).

Those persons are called 'department leaders'. Their actual role involves following closely the teacher with regard to the method used, to the learning process itself. Discussions are carried out concerning how learning takes place, what are the guidelines and goals

presented in the curriculum, and how they can be achieved. Possible problems are taken up, particular hindrances the teachers face, reactions the new demands evoke. They try to find out, in other words, in what way the present techniques and means used can be accommodated to the fulfilment of the curriculum, or what new elements can be introduced so as to facilitate that.

"It becomes very important that we have leaders, what we call department leaders, who [...] are very close to the teacher and the teacher's job, and can talk very much with the teacher and how he actually works, how he manages to apply what is included in the curriculum." (2).

The principal emphasises the necessity and significance of having an open communication with the teachers, of getting to know their situation, of listening to their point of view. The identification of the problems faced is not a matter of guessing; the action to be taken is not determined beforehand in someone's office. The teachers are the main source of such information, as they are the ones directly involved in the learning process. Their experience, thus, is of major importance. Moreover, the content of this exchange is not of an abstract, theoretical nature. The teachers are asked to provide specific instances of their everyday teaching experience, so that discussion address a concrete situation. The aim is to discover how and if specific instances from the curricula are actualised in the classroom, and not only to provide with general advice; concrete suggestions are given.

"[...] that they hear what the teachers conceive as a problem, that they wish help and support for, and that they manage well on their own. Then we use to ask them about this here, with how one applies the training, we are very concrete on it, perhaps ask them to come with an example of what they do, so we ask the teacher for examples on what he does in the training to ensure that here." (5).

Those type of discussions are not limited only between those department leaders and the teachers. The principal attempts to include also others holding central positions in the school sphere; she specifically refers to the inspectors.

"This year, we have let the inspectors and the department leaders to talk with the teachers, because it is of the same importance that they also communicate with the teachers [...]" (5).

Hence, it is indicated that the principal tries to create a working frame at school, where all those persons vital for the planning, execution and evaluation of the learning process are in contact with each other. She emphasises the importance of allowing the teachers to share their experiences and thus receive help where needed. The application of the curriculum guidelines is the final goal.

Furthermore, the teachers are supported in their effort to actualise the curriculum by given the freedom to design their own lessons. The principal believes that the full potential of the teachers is better employed when they make use of their strong sides. Each teacher is unique, regarding the educational background, personality characteristics, personal and professional experiences. Those factors influence the way they carry out the lesson with, the methods and techniques used.

"[...] We in the Norwegian school, will generally not tell the teacher exactly how one should carry out one's training. We will not do that. At least I will not do that. Because the teachers are so different, they have their personality, they have their knowledge, they carry their experience with them, and they must be allowed to use what they are good at [...]" (6).

The principal feels it is counterproductive to impose a certain way of teaching, for the teachers' skills and abilities might not be addressed at the appropriate degree. If the individual characteristics are not taken under consideration, the results might be disappointing, as effective learning might not be promoted in the best possible way. Thus, the teachers are the ones primary responsible for the teaching methods used, which can vary from the traditional lectures to the use of artistic means; every option is open.

"[...] it is like a football player, if you use the right foot, then it is silly to make the person play on the left side...it is important for us to allow the teacher use his individual abilities to make the teaching good. Someone is a good storyteller, and he can narrate, and keep the students' interest within a story, some are very good at other things, they might be good in dramatising, for example, in using drama in their teaching, while this would be a catastrophe for another teacher, who doesn't manage this assignment." (6).

The principal, hence, acknowledges the importance of respecting the teachers' preferences when it comes to teaching methods, determined by their personal style and characteristics, for they know best what they are most effective in.

At the same time, though, the teachers are expected to co-operate with each other, to have an open communication with teachers from different disciplines than their own. The principal emphasises the important of sharing one's experiences both with teachers and students, of creating a discussion arena where creative solutions might arise. The old attitude of isolation and exclusion concerning one's subject should be abandoned; the subjects share common elements, a fact significant to be realised.

"even though I said in the beginning that the teacher was free to use his/her own abilities, skills, s/he must participate in the work here, the common work [...] this to work in team, to work together with other teachers, to talk with the students, with the class, and interdisciplinary, [...] those I think are important. That the teacher does not -at such a

large extent as it perhaps was in the old days, worked with his own subject, in his own hours, with his own students and talked actually little with others about it. We wish to achieve an openness in this situation." (16).

So far, the principal has illustrated various ways in which the teachers are supported, motivated and enabled to organise the training in such a way that the curriculum guidelines are applied.

Similarly, the students' activity is also approached in an analogous way.

Firstly, the principal is particularly preoccupied with the application of special programmes. The school has designed a project which attempts to secure the relations necessary in order to apply the curriculum guidelines. The 'Active Project', in other words, provides with the conditions necessary for the employment of this learning method that enables fulfilment of the goals set, critical thinking included.

"[...] we make sure of some things in relation to working methods and this 'Active Project' which we have here at school, it tries to ensure in a better way than just using the core curriculum, that the students learn this here with critical thinking for example [...]" (7).

Specifically, this project has been carried out at school for quite a long time. Its main characteristic is the way the training into the various areas takes place. Instead of having a lot of subjects at the same time, the students rather go through one subject-area each time, within a given period. After the completion of such a 'learning unit', they start with another area; one school year consists of six such units. The principal explains the school was inspired to follow the above way by the schooling system of another country.

"The 'Active Project' is a project that we have had here at school for three years now, three to four years, we started after a studying trip to Island. Island has a totally different school system than Norway, more adjusted to modules, where the students complete subjects, while in Norway we have the subject-hours system, where students follow the same subject three times a week for example, through half a year. But what we have included in what we call 'Active Project' is this here organisation into learning units, where we divide the year in six learning units." (8).

The reason for the adoption of the above learning system, is that it enables the active participation of the students into the central aspects of the learning process. Specifically, students and teachers share the responsibility of planning, executing, and evaluating the training.

"[...] the central aim is to include what we are appointed to do, this with the student participation, that the students participate at a bigger degree in the training themselves, both in the planning, in the execution, and in the evaluation." (12).

The main decisions are made under close co-operation; they set the training goals, they discuss the learning methods available, the degree of responsibility the students wish to employ, what means will be used. The students thus contribute with own ideas and suggestions, their needs and wishes are taken into account and put into praxis.

"The point with it, is that in the beginning of such a learning unit, we wish that the students and the teachers work together on planning what will happen in the next weeks. That they talk with each other, what is the point with what we do now, how shall we do it, what kind of learning methods; shall we use group-work, project-work, shall we go out on an excursion, do they wish that the teacher lectures much from the blackboard, how it will be done." (9).

It is thus indicated that the main elements comprising the students' training are chosen with a democratic procedure, where both groups concerned –students and teachers- have the right to express their opinion and take a decision. The only case where the teacher interferes in a more authoritative way, is when agreement fails to be achieved; the teacher takes the final decision, always based on the common wish.

"So they agree about it –it has to be so, that if there is disagreement in the classroom, then the teacher has to decide what he thinks is logical, after having heard the advice he has from the students." (9).

At the same time, this high degree of freedom regarding the choice of learning methods and means, enables each student to make use of his/her own skills and abilities in a beneficial way. The students have the opportunity to adjust the lesson in a way that fits their individual needs, interests and wishes. This is also in accordance to the guidelines included in the national educational laws.

"this with differentiating the instruction –in the new training law which we now have in Norway, it says that the instruction should be accommodated to the individual student's prospects and abilities, when there are 28 students in a class, then it is a challenge for a teacher to follow that, adjust in such a way that it fits all the 28 students. (13) We believe that when the student works more on his/her own, then s/he makes use of the abilities s/he has [...]" (14).

This way of adjusting to the individual needs is actually necessary, taking the class structure under consideration. As the principal explains, there is no homogeneity regarding the students' level of proficiency; the competent and effective students are in the same class as the not so successful ones. Hence, the principal supports the school has to adopt the proper learning methods, in this case to allow the students plan and design the way the instruction takes place. It is a way to ensure that all the students at least have the chance to participate in the lesson, and benefit from learning.

"at the Norwegian school we have all possible student categories within the same school, within the same class [...] all students, from those who are strongly handicapped to those who have low abilities to learn things, to the very competent, they go to the same class, all go to the same class. This creates a very big challenge for the teacher, to include all together, because what motivates someone, might perhaps de-motivate another, so that we have made such learning strategies that include as many as possible from the students. We work on that, it is this that lies at the bottom of the 'Active Project', which we are engaged in." (51).

The principal once again underlines the importance of active student participation; the project elicits more responsibility from the students, as they are in charge of how the lesson is carried out. When they themselves decide on the methods and means used, they are more interested in and feel more responsible for the smooth development of the lesson, for the effectiveness of the training. They thus consider carefully their own actions and contribution, as they put own effort into its creation.

"What I believe in is that we can get the students to work more actively themselves with learning, to take more responsibility themselves for what is going on." (50).

Moreover, the aim is that each learning unit incorporate more than one subject-area, it should be interdisciplinary. The principal clarifies that this choice is made in accordance with the situation met at working life; it is almost always the case that the execution of a profession includes use of elements and aspects of more than one subject-areas. The principal tries to ensure that the way the students are trained is closely connected to the everyday life, that their education is not a separate part of their life.

"We use such a learning period –we want it to be interdisciplinary, so that at least two subjects are involved in the whole or in parts of the period, it should not necessarily be in six weeks continuously, but in any case when two subjects have some common points in that period. We want that the students are trained into realising that in the real world things are not subject-divided, we use a lot of subjects at the same time, indifferent of which profession one has." (10).

The students' education, in other words, tries to prepare them for the demands of the future working life by training them into making connections among the various subject-areas, into integrating their knowledge. Hence, the students are provided with the means to fulfil one of the requirements of critical thinking, meaning the creation of new connections among one's knowledge base.

Furthermore, the students and teachers co-operate on the evaluation of the training. Discussions take place on the initial goals and what has been actually achieved, the benefits gained. The students are also responsible for presenting their accomplishments, for

demonstrating to the others what they have learnt. This is done in a variety of ways, from lecturing to using artistic expression. The principal underlines that when the students are involved in the presentation of knowledge, then they learn much better than when simply listening to someone else. The active participation of the students in the learning process, , in other words, leads to realisation and insight regarding knowledge issues.

"So at the end of such a period, we want that the students and the teachers are together for some hours and talk a bit about what they have done, they should just as well present something, be it on the wall newspaper, a drama production with a film they have made, or just if the students give a lecture for the rest of the class. We believe that the students learn very much from this, to give a lecture for others, we do not believe, perhaps, that they learn so much by listening to someone giving a lecture. But this, to stand up, to give a lecture, we believe is rather instructive." (11).

However, the principal underlines that it is not all the students of the school that participate in the above project. Specifically, all the foundation courses take part; regarding VKI, only some subjects of a practical orientation are involved. This also refers to the problems faced with the theoretical subjects, like AA, as discussed more extensively in the previous part.

"[...] this year it is our seven foundation courses, and one class of VKI FO. Next year it will be also VKI music, DD, VKII FO. [...] Then it will be half the school. [...] Only the foundation courses AA participate [...] It is the first time they are included this year" (17).

The principal gives a parallel reason for the hindrances met when trying to apply such an innovative way of learning; namely the working agreement the teachers have. It assigns responsibility to the teacher for *what* to be taught, meaning the content and volume of the learning material to be covered, but not for *how* to achieve that. It does not, in other words, oblige the teachers to adopt this way of carrying out the instruction, of sharing this responsibility with the students.

"[...] the working agreement for the teachers, which is very much adjusted to the subject. The teacher shall teach within a subject, he shall meet his students in the subject, according to a reading obligation agreement, which regulates how much the teacher shall work in the various subjects, and actually counteracts much of what we otherwise work with. The teacher can teach in English and French, he has the responsibility for the students to learn some English and French. He doesn't have responsibility for what is included here [in the core curriculum] [...]" (28).

In addition to this specially designed programme, the principal refers to other smaller projects the school provides in order to secure the application of the curriculum. The class

leader, in particular, is in charge of carrying out classes concerning issues of a central interest for the students, on a rather frequent basis.

"We have tried in various ways to make sure we take care of what is included in the core curriculum, it can for example be done under what we call module hours, environment learning hours [...] all the seven foundation courses have such an hour per week. There [...] [they go] through for example studying techniques [...]" (29).

Concomitantly, the principal emphasises that the students are addressed primarily as being persons, and not only students. The possible problems and discomfort a student might have as a result of situations emerging in everyday life influence also his/her way of being at school. The principal supports, therefore, that they should discuss with the students issues that concern all the aspects of their life, relations, personal matters, their questions and worries, they should ensure the students' well-being at all possible levels. The class leader mentioned above, is mainly in charge of taking up and confronting such issues.

"[...] It can be material that concerns intoxication means, it can be material that concerns how one improves the classroom milieu, how one can hinder conflicts between students, all those everyday problems that students are concerned about. Because a student, he is not a professional person in his head, a student is a human being, with all the worries and sorrows and joy which a person has. So 'professional student' is only a little part of this person" (30).

The principal emphasises also the significance of addressing each student at an individual level, to treat him/her not as a part of a mass, but as a unique person with individual needs. This applies particularly in the case of those who do not use to present themselves in a noticeable way, who do not attract one's attention. The class leader should be sensitive enough to include all students in such conversations. Such meetings take place on a regular basis.

"we try to put quite big weight on that to see the students, the teacher sees in the eyes for example of each individual student every day, this can be a goal for a perhaps special class leader who has time to see each student, also those who are shy and keep to themselves and not just those noisy boys who often attract attention. (31) [...] we have the weekly hour where the class leader has two conversations with every single student, every year [...]" (33).

In order to successfully approach the students, the school tries to appoint as class leaders those teachers who are inclined and open to face and treat the students as persons. The school has even provided a kind of training for the class leaders, where emphasise the significance of addressing all the aspects in the students' life.

"The class leader is a usual teacher, but we can say that it is a teacher who we believe has special abilities to work with the students, also

with the human side. (32) We had a separate class leader seminar, a two-day course in autumn, for those who are class leaders this year. There we went through all those things a class leader should pay attention to, work with, discuss things [...]" (33).

Once again, the principal underlines the variety of issues the class leader discusses with the students, ranging from personal wondering to classroom issues. They try to examine how the student feels in the classroom environment, what s/he thinks of the school work, his/her attitude toward learning. Those conversations can also be a kind of preparation for the requirements met in the future working life, as the student is motivated to reflect on for example co-operation problems and how to solve them. The class leader, thus, tries to cover most of the spheres the students belong to, aiming also at possible ones in the future.

"[...] they talk about the content of the core curriculum, about how the student is, as a person, but also a bit about this here with how the student worked, if he had enough time, if he is willing to co-operate, perhaps all those abilities necessary in the working life or also about this to learn to work together with others." (33).

In addition to the effort paid to provide for the students' well-being, the principal stresses the importance of approaching the students as equal. This is related to the issue of letting the students assume responsibility for their education. The students become in charge of discovering and transferring the knowledge; the teachers are no longer the exclusive legitimate source of information. When students and teachers are considered as parallel travellers in the quest for knowledge, the passivity which would otherwise have characterised the students' attitude, is substituted by an active participation. This is not possible to occur in a school governed by hierarchical relations, where the students attend the lessons because they are obliged or forced to, against their own will. Active participation conveys own interest and inner drive.

"we do not want such a discipline, a school which is very much scourged by discipline and hierarchical structures, where the teacher lectures to the students, we don't want that. That will be very foolish, because it is, I believe, even more intensified that the student becomes passive and a receptor of information." (49).

To sum up, the principal's departing point is the fulfilment of the core curriculum guidelines, and subsequently the application of critical thinking. She describes actions taken and attitudes assumed that support and help both teachers and students toward the achievement of those goals. She refers to close co-operation among all the groups involved, to the adoption of specially designed programmes, to the creation of a personal relation with teachers and students. Finally, another factor sketching this school's culture, is the particular

problems faced with achieving the above, with the theoretical studying directions, for example AA.

The principal of *School 2* is now presented by reference to the same categories.

Initially, it should be mentioned that the principal does not teach herself, and is not thus in direct contact with the students.

"[...] At our school today, we have such an organisation that I am not out in the teaching. Not at all." (20).

Still, she acknowledges that part of her role is to ensure the application of the core curriculum. This is achieved not by being involved in an exchange with the students, but indirectly, through interaction with the teachers.

"[...] But I am not in the instruction and see that this here is being attended to. It is through the meeting activity I have with the teachers." (22).

As the main role of the principal is of an administrative nature, she has frequent and close communication with both the teachers and the other administrative personnel. The school is divided into sections, according to the level of education, where each section has a department leader in charge of instructional matters. They meet with the principal rather often, to discuss issues regarding the students' training.

"I lead the school through the forums where I meet the pedagogical staff, and where I meet the department leaders. We have three department leaders regarding the instruction [...] We have meetings for the department leaders each Monday, and there we discuss all the sides of the training." (20).

In addition, regular meetings with the teachers from all the sections take place. Their content consists in conversations around instructional issues, specific problems that the teachers face.

"[...] we also have this contact I have directly with the teachers, where I take up concrete things, it is what we call the 'ped-sections meetings'. There we have a common meeting for all the teachers, from all the sections, where we discuss and pose questions." (22).

While the principal mentions discussing instructional matters, she at the same time maintains that the specific paragraphs on critical thinking I pointed out from the core curriculum, are not actually specific goals, but a description of what the instruction should include. When I asked her the way with which she ensures that those goals are achieved, she corrected me by indicating the above.

"What I have read now, is not some goal, it is not a goal description, first of all. It says here something about what shall be included in the

instruction." (1).

The conception of those paragraphs as being part of the *content* of the instruction rather than *goals*, influences their gravity within the students' training. Them being a description of the instruction signifies that the training should take place by *use* of those concepts, rather than by *developing* and *promoting* them. Critical thinking thus becomes a requirement, instead of a learning objective.

The above is supported by reference to the principal's description of '*Veiviseren*', the methodical school guide meant for student use¹⁰⁵. According to her, both the core curriculum and *Veiviseren* signify various skills and abilities the students should possess, in order to carry out the educational goals. The students are expected to execute a certain kind of assignments, which require a level of proficiency.

"Because part of the texts and the expectations from the students, which are found in this document there, the core curriculum and also in that document which concerns [...] it is a document that the students shall use...*Veiviseren*, there stand very big expectations and demands of what the students are capable of doing." (2).

Accordingly, the principal acknowledges that critical thinking does not comprise a subject of discussion at the meetings with the teachers, it is not a focus there.

"This here, it has not been a focus at any large extent at those meetings. It has not been, it is not that which has been prioritised for us at those meetings." (21).

Rather, the principal maintains that the whole of the instruction and training concerns critical thinking. As seen also above, the kind of assignments the students receive, and the way they learn (i.e. by solving a problem in practice), involves assessment, reflection, observation, decisions, as indicated in the core curriculum paragraphs.

"[...] If you think about this here...that we shall promote training in thinking –in making conjectures, examining them conceptually, drawing inferences, and reaching verdicts by reasoning, observation and experiments [Core Curriculum, p. 13] this here is where all the training aims, you can say. (23)".

It is indicated, hence, that the students should be able of using their mental capacities to carry out the assignments appointed; the more experience and knowledge they get, the more responsibility they are given for taking major decisions. As seen in the first part, it is more a matter of learning than training into critical thinking.

Nevertheless, the school wishes for the students' participation in the learning process.

The principal indicates that the students are given the opportunity to express their opinion and make suggestions about how the instruction should take place, or to evaluate the present situation. The school follows the educational guidelines given, and wishes to accomplish an integration of the students into the central aspects of the learning process.

"[...] this here with student participation which is a focus area within the educational division, to get the students to be active in the planning of the instruction, the execution of the instruction and also the evaluation of themselves. [...] (6) We give a big freedom to our students, we allow them to participate and make the instruction, if they want to be in the workshop and learn there, or if they want to be in the theory room and learn there." (9).

The opportunities, in other words, for active contribution of the students on those areas are provided by the school. However, the principal explains that the students show a lack of interest to do so; the majority of them are not willing to pay analogous effort. This results in that the whole responsibility of the student participation is left to the few students who are engaged into the learning process in that sense.

"[...] and we struggle to engage the students.[...] we have a handful of students [...] who are active in the student council, among others. They assume a very big load of what is expected from the students in relation to being active toward us, the administration at school, and toward the teachers. [...]" (6).

The principal accentuates the problem the school faces with motivating the students. They show a very low enthusiasm and will to attend school, let alone participate actively in the learning process.

"and the most difficult today, is to give them a push. Motivation, and the will, and this is reflected also in relation to this here, to take responsibility for one's own learning, to participate in the instruction, to be interested and be allowed to participate in decisions." (8).

The students are so little interested in school, that sometimes the teachers themselves have to bring them there. Hence, the most vital goal for the school becomes to activate the students toward attending the lessons, and reduce their being absent as much as possible.

"[...] the absence problem is a focus area at school, to get the students to be at school, to get them to come. We drive and pick them up in the morning, some of them." (19).

The main reason for the students' attitude, is their low school performance, according to the principal. As seen also before, the majority of the students suffer from learning disabilities, which is related to insufficient levels of knowledge, inadequate possession of

¹⁰⁵ See 'Reform 94', chapter 1.

skills and abilities necessary to carry out the educational goals.

Parallely, the principal also hints at another possible factor maintaining the students' low engagement in the school activity, which is the teachers' actions. As she explains, most of the teachers do not have a background as pedagogues, did not receive analogous training. They come in their majority directly from the working life, they are professionals.

"[...] we have very much workshop, very many teachers come from a workshop milieu, they are working people" (7).

This implies that not all the teachers possess the pedagogical knowledge that would enable them to approach the students in a such a way that their motivation increases. They are not educated to appeal to this side of one's training, but mainly to the pure practical and technical part of it.

In any case, the principal views her students as being qualitatively different than those attending other schools; they are not initially capable of the actions and processes described in the critical thinking paragraphs in the core curriculum. They do not fulfil, in other words, the demands upper secondary education poses. The principal explains the above is based on personal observations after analogous discussions with the administration of other schools. Her students are especially disqualified, in the above sense.

"Some of what we struggle most with, is exactly what is pointed out here. I am present at quite a lot of leader-meetings, and talk with principals from other upper secondary schools. [...] and we have meetings together with students from other upper secondary schools [...] where there is a totally different student group than what we have here, which in a way is much more, thinking, reflected, in the way described here. In other words very critical, concerned about the way to learn etc." (3).

The principal maintains that the reason why a large part of the students attending her school suffer from learning difficulties, is the changes introduced with the Reform -94. The new educational law, namely, gives priority of admittance to those students of a special background.

"And this is a new situation for us, after the Reform. (5) There is an extremely big difference. [...] They [a-applicants] come first, and they can be badly qualified. Before, we had only a small part of those applicants." (14).

As seen more extensively earlier, those students mostly attend the school due to a belief that the requirements posed in this type of education are more attainable than those in a theoretical education. The principal supports that the students of high school performance usually attend AA, while the others who are not so competent attend schools like hers. The

students, in other words, are not highly motivated to attend the school, as they were 'forced' to apply there, chiefly by external reasons.

"[...] When the students go to the lower secondary school, there are some who we call 'school competent' –I underline the expression 'school' competent, and not 'competent' [...] and those school competent students continue mostly within AA. At our school, we had the current year over 40% of students with defined learning difficulties. In form of reading and writing difficulties, behavioural problems, subjects that they have not taken, so that the attitude concerning attending school, the motivation to go to school is very, very low. (4) [...] Before the Reform, we also had two year older students in average, but they were motivated to come here, were interested in learning." (5).

In addition, their past educational training is not always integral or of a high degree of proficiency, as the new educational rules do not demand that they have successfully completed lower education in order to attend upper secondary schools.

"[...] now, all the students are integrated, also those who did not succeed in the lower secondary school shall go to upper secondary and get a place. We didn't get this type of students before, as they were obliged to have passed the exams in order to come to us [...]" (16).

Hence, not all students will be able to fulfil the goals set; they do not all possess the skills and abilities that the principal maintains are demanded from the core curriculum.

"Therefore we do not have, at the basis, a lot of the students, the qualifications which we attribute, the qualities included in the core curriculum. Because here there is something expected from the students also [...]" (18).

The students' lack of qualifications influences the way learning takes place. The principal explains that the school has an almost exclusive focus on praxis and on being educated through practice, as the students face considerable difficulties in reading a text, comprehending its meaning, and then applying it. Direct teaching and engagement with the working object is preferred, as thus there are more chances of a successful result, i.e. learning.

"For our student group, after the Reform, since 1994, we have come to the almost unambiguous conclusion that whatever we can omit from theory, we will omit it. (39) [...] we have at the smallest possible degree theory. Exactly because we know that there are so many students that do not understand what they read. (41) [...] Our departing point is that we shall work with the practical, and then we go to the theory room when we need to do so. Next year, we will also move part of the AA out to the workshop." (45).

The above takes place in accordance with the specific syllabuses, where the exam requirements are included. The principal emphasises that they have to focus and prioritise issues other than critical thinking, as it is not actually a target of examination.

"[...] and we must remember that, the core curriculum will not be run a final test on at all, they do not get a grade on that, it is not included in the exams either. So it is the specific subject goals [...]" (40).

It should be finally mentioned that the principal does not exclude that her students can develop the ability to demonstrate critical thinking. She clarifies that it is rather a matter of being used to receiving things in a passive way, being used to a kind of a mental numbness.

"No, I am not saying that they cannot become [able to demonstrate critical thinking]. But they are used to sitting on the school bench through very many years and receiving very much. So if they shall develop a critical sense, make own judgements, one has to be active, there must be something going on here [points at her head]." (10).

To sum up, the principal's departing point is to achieve the syllabus's goals. She views the core curriculum as a description of the nature of the instruction. She is in close contact with the teachers and the administrative personnel, as they discuss various issues concerning the students' training. With regard to the students, her main objective is to engage them into the school activity. She is particularly concerned about the fact that big part of the students suffer from learning difficulties, have low school performance and thus do not possess the qualifications posed by the core curriculum. The training is adjusted accordingly, meaning that the school prioritises practice in order to fulfil the exam requirements. As such, critical thinking is not a focal point in the students' training, but is however involved in the type of work carried out. The students face difficulties in demonstrating it, mainly due to their low school competence and inactivity. The principal indicates they do not have previous experience with how to deal with such a situation, as it has been recently formed, as a result of educational measures.

A parallel examination of the two principals reveals interesting differences.

A first glance at the principal's *role* shows that there is a difference in the degree the principals communicate with the students. The principal of School 1 (hereafter principal 1) teaches herself, whereas the principal of School 2 (hereafter principal 2) does not. This implies that the first is in direct contact with the students, while the latter is not.

They both, however, are in regular and frequent communication with the teachers. They ensure that corresponding meetings take place, where both the teaching personnel and those involved in positions of a more administrative nature share experiences and discuss issues around instruction and training.

A diversity here concerns the extent to which this communication is spread. Principal 1, namely, tries to ensure contact between all the groups involved; between the

administration and the teachers, the teachers and the students. There are certain persons in charge of the above, in all groups; the department leaders and the class leaders. The latter receive also a special kind of training, so as to be able to approach the students in an appropriate way.

However, principal 2 pays more emphasis to the relation between the administration and the teachers. The interaction with the students is not so well defined, framed or organised in the same systematic way. The knowledge to the students' sphere, their problems and opinion, is not achieved in a direct way. The principal has access to them principally through the teachers.

Finally, they both acknowledge the actualisation of the core curriculum as part of their duty. Again, principal 1 receives information on the issue directly from both teachers and students, whereas principal 2 only from the teachers. A vital point of divergence here is that principal 2 does not conceive of the curriculum content as educational *goals*, but as *content* of the instruction.

Examining now more closely the *culture* constituents, principal 1 describes organised efforts to secure the application of the core curriculum, and subsequently of critical thinking. A specially developed project is at use, which addresses active student participation in the learning process, interdisciplinary lessons -which also involve co-operation between the teachers- group-work and project-work, which involves co-operation between the students. Teachers and students are of an equal status regarding access to and possession of knowledge. Moreover, the students are approached initially as persons; they are addressed in their everyday existence, regarding problems of all nature.

Principal 2, though, acknowledges low student participation in the school. The main factors determining that are the students' lack of motivation and interest for the school activities, as well as the fact that they suffer from learning difficulties. They do not possess the knowledge, skills and abilities required, so as to fulfil the curriculum and subsequently employ critical thinking. Even though the principal acknowledges personal problems the students face, also as a result of their low performance, no systematic efforts are made to approach them.

Training into critical thinking is not prioritised by principal 2. Secondary reasons to the students' level of performance, are the exam goals, which demand other qualities than demonstration of critical thinking. Praxis is thus in focus, as most of the training takes place in a practical way.

Likewise, principal 1 acknowledges facing problems with the application of the

curriculum in the theoretical oriented subjects. She, however, attributes them not to the students' qualities, but to the subject's nature and the teacher's attitude. The first refers to the lack of a practical character, and content volume, whereas the latter to the problems arising with the demands of the new teacher and student role.

Accordingly, principal 1 sets the practical character of a subject or assignment as one of the major requirements for the application of critical thinking. However, this does not play a vital role for principal 2; even though the training is almost exclusively practically oriented, critical thinking is not present.

To sum up, the most remarkable difference detected between principal 1 and 2, is the expectations and attitude held toward the students. Despite the fact that they both acknowledge certain difficulties with applying the curriculum, and thus critical thinking, the reasons they present are of a different nature.

Principal 1 emphasises the significance of *external* factors, meaning the subject's nature, the teacher's attitude and the exams' goal. Principal two, however, focuses on *internal* to the students factors, meaning learning difficulties, knowledge, abilities, performance, and consequently motivation. Even though she makes reference to the exams' goal and the fact that the teachers are not educated pedagogues, her departing point is the students and their qualities.

In commenting the above, three observations are made.

Firstly, the fact that principal 2 is not in direct contact with the students, might deprive her of the necessary insight to their situation, problems they face, and eventually areas where improvements could be made. The total absence of any references to the students' abilities in an analogous way from principal 1, reinforces this remark. As she teaches herself, she has direct access to the everyday reality in the classroom, has a better chance to observe and analyse the students, and also discuss with them. Naturally, this non-consideration of the students' abilities does not mean that all the students attending School 1 are competent. The principal herself refers to the challenges posed when the classes comprise of students that range from strong handicapped to very competent ones. She acknowledges struggling with applying in practice differentiation, meaning adjusting to each student's needs and abilities.

Yet, her answer to this challenge is quite different from principal 2. Principal 1 lets the students adjust the learning process to their own needs and abilities. By participating actively in the learning process, they have the chance to use their strong sides and promote their skills in an effective way. Principal 2 argues this cannot be done in her school, as the students are first of all not motivated to attend the lessons. Principal 1 supports that this is exactly the way

to motivate them, to give them responsibility for the instruction and thus turn it into something they own, not a foreign activity. She is applying this at her school, and experiences the results directly. Thus, Principal's 2 distance from the students might signify a lack of knowledge and inspiration on how to solve analogous problems; they might not be seen in their full dimension, also from the students' point of view.

Secondly, the fact that principal's 2 departing point is the students and their abilities, might actually reinforce the problems faced rather than decrease them. Her main concern is the students' low proficiency, the fact that they suffer from learning difficulties, which is directly connected to their being low motivated for school and learning. This seems though, like a vicious circle, as low motivation is attributed to low school performance and vice versa. For instance, when principal 1 supports that the way to motivate students is to give them responsibility for the learning process, principal 2 answers that this is not possible, due to the students' low school abilities. The difficulties faced with the application of critical thinking, are centred to students. Yet, in this way, no solution can be found. If we accept that this situation mainly depends from the students, it is almost impossible to ever promote and apply the core curriculum, as it is not achievable to make up for their incomplete previous schooling within the few years of the training.

However, principal 2 made a minimal reference to the teacher's influence on the above, by saying that they are mostly working people, professionals, and not educated pedagogues. Perhaps a focus shift away from the students is beneficial at this point. As principal 1 signifies, the teacher's attitude should not be ignored; teachers face problems in adopting their new role, in working in novel ways so as to follow the new guidelines. This implies that most probably the teachers from School 2 also face similar difficulties; a concentration on that side, as well, might prove fruitful. In addition, focus on how to motivate and engage students within this frame might make a difference.

Thirdly, the fact that principal 2 considers the core curriculum not as containing goals, but a description of what the instruction should include, determines where the focus is put. As seen above, this is translated into various requirements and expectations regarding the students and their abilities. Acknowledging the students' low school competence, such a way of viewing things, is certainly making the application of the core curriculum unrealisable. Besides, if critical thinking is something included in the training and not a goal per se, its promotion is naturally secondary to the achievement of the exam goals, as seen.

4.1.2.2. School cultures

Having the above in mind, some major remarks concerning both School 1 and 2 are now made by emphasising the role of the context. In order to facilitate this elaboration, the data will be examined by use of the three main aspects of critical thinking; perception, requirements, application.

The *perception* of critical thinking depends on the nature of the subject. Variations in understanding emerge, according to whether the subject is;

a) theoretical: critical thinking embraces the examination of the information and knowledge provided, as well as the production of own judgements.

b) practical: critical thinking embraces the analysis of the working process, and the evaluation of the work produced. Parallely, the evaluation criteria followed, also depend on the specific characteristics of the subject. FO for example refers to colours and perception, DD involves feelings and personal preferences.

c) directly related to the working life: critical thinking includes understanding of the pair theory-praxis, discovery of practical solutions. This concerns the participants from School 2; they are mainly concerned with the application of the theoretical knowledge onto real working-life situations.

The *requirements* described for the employment of critical thinking belong to the following groups;

a) factors that can be *learnt*: knowledge, practical experience.

b) factors that *cannot be learnt*: level of biological development, learning difficulties.

c) *personal* attributes: competence, effort, previous school performance.

The above three groups regard exclusively the students.

d) *attitude*: for the students this is translated into interest, will, opposition to norms. For the teachers this signifies willingness to adopt new methods, being inquisitive.

e) *milieu*: openness from school and teachers.

The students emphasise more *external* factors, like the milieu, whereas the teachers underline the students' qualities. The teachers' attitude is here of a great significance, as the promotion of critical thinking depends mainly on whether they believe it is an object of learning or not.

The AA teacher, for example, attributes it to biological factors, that cannot be controlled. A similar situation is found with the teachers from School 2, who relate the ability to demonstrate critical thinking to the presence of learning difficulties. A characteristic controversy here is that the only student who declared directly suffering from learning

difficulties, was the one whose description conveyed participation and application of critical thinking as maintained by both the principal and the teachers!

In both the above cases, the promotion and development of critical thinking does not take place, almost not at all. Hence, one of the factors the students consider as essential for the development of critical thinking, namely the favourable milieu, is excluded. Consequently, the students do not feel motivated or enabled to employ critical thinking, a situation which for the teachers signify lack of analogous interest, abilities and skills. This is quite clearly seen in the case of student 1 from School 2, for example, who indicates will and interest into employing critical thinking, but expresses a lack of corresponding motivation from the school's part. The teachers, however, mainly refer to the students' low proficiency.

The principal's attitude is of a significance also. The factors the principal identifies as determining the demonstration of critical thinking, are reflected mostly in the teachers' descriptions. Within each school, an almost unanimous experience of critical thinking is found. School 2, for example, shows a common emphasis on the fact that the students suffer from learning difficulties. No reference is made to the teacher's way of being, something that presumably also reinforces the teachers' own preoccupation with the students' qualities.

In School 1, the principal and the teacher of AA have a totally different conception; the first refers to factors that can be learnt, whereas the latter mentions biologically determined factors. The principal acknowledges a distance between her and the theoretical subjects; she experiences that as a factor influencing the unsuccessful application of the curriculum. It is indicated, in other words, that the differences found are due to a lack of *communication* between the principal and those teachers; their experiences and ideas about school issues have not been completely conveyed to each other.

There is, thus, an influential force hidden in the interaction between the principal and the teachers, direct or indirect. The way they perceive critical thinking and the conditions required, sets in a way the line the school follows regarding educational matters, in this case critical thinking. This situation influences in turn the students, who suffer the consequences of the attitude adopted, positive or negative. They, indeed, also contribute to what the teachers and the principal stand for, by providing their experience, but this again depends on whether they are included in this communication arena or not. Besides, as is usually the case, the students are not the ones imposing attitudes and ideas on the teaching and administrative personnel; albeit democratic, the school structure maintains at a certain degree the classic role differences. School policy is primarily defined by all others, but students.

Likewise, the *application* of critical thinking is related to the nature of the subject.

It is difficult, if not impossible to be demonstrated, when;

- a) there are *determined rules* to be followed, as in the example of mathematics.
- b) where one learns something totally *new*, as with a new language.

It depends on;

- c) the opportunity to assign *practical assignments*, as in DD.
- d) the subject's volume of learning areas to be covered, as in AA.
- e) the *exams' goals*, whether they for example address pure reproduction of knowledge.

Interestingly, at School 1 those involved in the practical subjects find it easier to apply critical thinking, due to the nature of the work. Yet, this is not the case with School 2, where the application of critical thinking is rather limited. Further elaboration on the issue offers two remarks.

Firstly, the training in School 2 is directly connected to the working life. The students practice by working on cars that actually belong to real customers, their actions have direct consequences on others. An omission from the students' side, might risk somebody's safety. Hence, the teachers feel responsible for ensuring the correct handling of the working object; they cannot leave the students make major decisions on their own, for example, they need to instruct them on what to do, if uncertain. The type of work assigned to the students, in other words, cannot always address critical thinking, as experienced by the participants. External factors determine the amount of responsibility and freedom of movement the students can have. The above can be detected in the principal's description, for example, when she refers to the accident occurred when the car the student delivered to the customer lost a wheel. Safety matters play a significant role.

Secondly, the teachers emphasise that the nature of the work is such, that it requires the acquisition of experience. Obtaining automation and working routines are considered essential to the execution of the work. Thus, the focus of the students' training is turned elsewhere than critical thinking. The teachers refer to learning by experimenting, making mistakes, trying and failing, and eventually detecting the correct action to be taken. This is part of the process they have to go through, in order to become professionals. This implies, in other words, a form of rote learning. Here we do not deal with theory and reproduction of numbers and facts, as for example in AA, but with the creation of clear connections between conditions/problem faced and analogous actions. Naturally, it is not ignored that this kind of work also requires other types of handling, but the participants referred mostly to the above process, for the particular students, of the particular school level.

Thus, the above two particularities pertaining to School 2 have to be considered in addition to the training being of a practical character. This by itself is not adequate for the application of critical thinking.

Again, the beliefs held here by the school are important. A teacher who perceives his/her subject as not open to critical thinking, for example, will not promote it in the class. In contrast, principal 1, who supports that the practical assignments are the ones providing the opportunity to demonstrate critical thinking, tries to employ them in the lessons.

In addition, the emphasis paid to the core curriculum guidelines plays a role. Priority of the exam goals, for example, counteracts the promotion of critical thinking. Principal 1 wonders about ways to alter the exam system, as it is in clear opposition with the school-work, which aims at the actualisation of the curriculum; principal 2 explains the lack of training in critical thinking by reference to the exams. The focus of the instruction and training is influenced by the importance the various areas carry for the school administration.

Likewise, apprehending the application of critical thinking as having direct consequences for oneself is also significant. For instance, those who mention that it provides with enhanced self-awareness regarding one's knowledge and actions, or increment of comprehension, give certainly much more value to critical thinking than those who do not.

Other elements that need to be addressed at this point, are the number and type of subjects the schools include. As seen previously, School 1 comprises of three different studying directions, whereas School 2 provides only vocational training into mechanical subjects. The diversity of subjects found in School 1, enables the creation of those conditions that enable the demonstration of critical thinking. For instance, interdisciplinary lessons can be carried out, which provide with opportunities for co-operation both between and among teachers and students, for the execution of group-work, and project-work. School 2, however is disadvantaged from this point of view. The circumstances that would promote training and development of the ability to synthesise knowledge from various areas, for example -which was identified as important by principal 2- are not as prosperous.

At last, but not least, the attitude of the school toward the learning strategies plays an essential role to the demonstration of critical thinking. The consideration for example that those techniques are only useful to reading comprehension, limit their applicability. The way to identify the main points, to evaluate based on a criterion, to examine an issue from many perspectives by using one's own knowledge and external sources, the assessment of factors, are techniques that students from all the studying directions can have use for. The connection between them and critical thinking needs first to be made, so as to acknowledge their

contribution in the application of critical thinking.

Once having established this, then the function and effectiveness of the various corresponding courses can be assessed in a different way, and the need to incorporate them within each subject can be seen; this need was indicated by the participants. When the principals and teachers consider them as a lesson taking place only once, or as directed specifically to theoretical lessons only, their potential to enable the students to demonstrate critical thinking is not exploited. Lack of training with such techniques is reflected in the lack of training with critical thinking, and eventually in its application.

Likewise, the kind of factors believed to determine the development and application of learning strategies is significant. As seen in the case of AA, for example, biological reasons hinder the teacher from providing help with training into learning strategies.

According to the above, critical thinking should be examined under the *structural relations* which operate in the school. School 1 is mainly characterised by a particular interest in applying the core curriculum guidelines. Analogous actions are taken in the form of programmes and smaller projects, as well as special training for the teachers. A close interaction between all the groups involved is attempted, with the establishment of clear communication patterns, in addition to the fact that the principal teaches herself. Within this structure, the students are enabled to participate actively in the learning process and execute assignments in a way that promotes their critical thinking. The school is attentive to the students' experiences, ideas and problems. Obstacles and hindrances arising in the application of the above are mainly attributed to factors external to the students' abilities, pertaining to contextual circumstances. The main course the school attempts to set, is a favourable to the students' development and to the application of critical thinking milieu.

School 2 is mainly concerned with the training leading to working professionals. The initial focus is the students' low motivation and enthusiasm for the learning process. The fact that a big part of the students suffers from learning difficulties, dominates the thoughts and actions of the principal and the teachers. The students' lack of abilities and skills determines the way the instruction takes place, as well as the content of their work. Training is mostly concentrated in establishing an understanding between theory and practice, and in acquiring routine working patterns. Even though the importance of critical thinking is acknowledged, it is still not a priority area, firstly due to the inability of the students to demonstrate it, and secondly due to the priority of the exam goals, which do not include it. The principal is involved in the instructional matters, but only through discussions carried out with the teachers. She does not have an established contact with the students, both because she does

not teach herself, and due to absence of organised contact meetings. Communication patterns thus exist mainly between the teaching personnel and the administration of the school. The students' experiences are implied, not accessed directly. Hence, main differences exist in the perception of crucial aspects of critical thinking, for example the factors required for its application. The students emphasise external to them factors, whereas the focus of the teachers and the principal is on the students' abilities.

To sum up, the above indicate that regarding critical thinking, more weight should be given to the *structure* and *organisation* of the school, as well as to the *attitudes* promoted, instead of the quality of the students. Among the elements to be considered are firstly whether there exist well organised, systematic efforts toward the promotion of student participation. Secondly, actions and alternations which address the teachers' way of working, as well as their beliefs about the students' new role need to be examined. Beliefs about the role and significance of the students' abilities and skills should also be considered. In addition, the particular characteristics of the school have to be taken into account. The level of responsibility involved in schools where the training is directly connected to the working life, for example, influences the amount of initiative the students can take.

Each school, thus, has to consider appropriate areas where the development and application of critical thinking can take place. Careful investigation of the components of critical thinking, in relation to the processes, factors and patterns involved in the training is necessary.

Finally, let me underline here, that the above presentation is naturally not meant as a personal critique against any of the participants, or the schools as a whole; it is an examination of the role the context plays in the perception and application of critical thinking.

4.1.2.3. Summary of the section

The present section was concerned with the comparison of School 1 and School 2. First, a comparison between the two principals was made, focusing on their beliefs and actions regarding critical thinking promotion. Secondly, the two schools were examined in a parallel way, where the school organisation, structure and particularities were proven influential to the critical thinking application. Identification of the contextual factors and their role in the way the phenomenon of critical thinking appears at school was made. Hence, the main features of each school culture were drawn, and their relation to critical thinking was detected.

The next level of the educational system is now looked upon; namely, the experiences

of the Pedagogical Leader and the Department of Education.

4.1.3. Critical thinking – its metamorphosis from theory to practice

In the present section, the way critical thinking is experienced by two persons belonging to a higher level in the hierarchy of the educational system is analysed. Namely the perception and application of critical thinking according to the former Minister of Education, Gudmund Hernes, and the Pedagogical Leader pertaining to the schools' county are presented. The underlying aim is to unfold the way the phenomenon alters and develops, all the way from the Department of Education to the individual school participants. For this reason, first the gestalt of meanings conveyed by G. Hernes is presented; it is examined parallel to the descriptions obtained by the school participants. Secondly, the gestalt of meanings conveyed by the Pedagogical Leader is elaborated, also in relation to the other participants. Some final remarks are made, concerning the whole network of relationships conveyed by the data.

4.1.3.1. Gudmund Hernes and the school participants

As seen from the following table, the data obtained focus on the perception and application of critical thinking. Information on learning strategies is not included, as G. Hernes is considered to be the main representative of the core curriculum and the meanings conveyed in it.

Table 4.14. Constituents for G. Hernes - Critical Thinking

PERCEPTION	APPLICATION
<ul style="list-style-type: none"> ◆ Discovery & identification of evaluative criteria ◆ Mental elaboration of criteria ◆ Application of criteria <p>It leads to:</p> <ul style="list-style-type: none"> ◆ comprehension of extant ideas ◆ production of novel ideas ◆ preservation of traditions <p>It requires:</p> <ul style="list-style-type: none"> ◆ awareness of alternatives ◆ personal interest for object & others ◆ familiarity with the situation <p>Contains a 'productive' contradiction.</p>	<ul style="list-style-type: none"> ◆ Examination of familiar situations ◆ Execution of practical assignments ◆ Introduction of theoretical issues with a practical illustration ◆ New knowledge building on old one <p>It depends on:</p> <p>a) the teacher and his/her ability to</p> <ul style="list-style-type: none"> ◆ stimulate the students' interest ◆ make the students aware of their knowledge ◆ present issues gradually ◆ accommodate to the situations/students ◆ illustrate thinking out of conventional frames <p>b) the student and his/her awareness of the knowledge and skills possessed</p> <p>c) the nature of the subject</p>

Starting with the *perception* of critical thinking as presented in the core curriculum,

Hernes clarifies that it addresses the process of *creating*. As seen before¹⁰⁶, the core curriculum includes six human types; critical thinking pertains to the 'creative' human being.

"[...] and this [the two paragraphs] goes in that part which regards the creative person [...]" (1).

Specifically, the process of creation concerns three main areas. The first one refers to the educational method of learning by use of practice; this involves the execution of practical assignments, with possible mistaken actions and eventual identification of the correct way to proceed. Hernes specifies this way of creating stems mostly from the public, popular practice.

"[...] and then I tried to identify what are the main genres in creating. And you can say that the one is related to this which has played a big role into pedagogical thinking, which is 'learning by doing'. In other words you learn by doing it, and you learn by committing mistakes, and when you commit mistakes, then you discover that, you can correct it [...] (1) and it is perhaps the most important of the popular traditions [...]" (3).

The second area regards the scientific realm, where more specialised methods are involved. This manner of creating is the contrary of popular practice, as specific education into the means and techniques applied is required, as opposed to the inheritance of traditions.

"The other is the opposite of that, which is the scientific tradition, which requires special training which has its techniques [...]" (4).

The third area is the one which regards critical thinking. It addresses an object or situation and its evaluative criteria; three components are involved here.

Initially, the presence of certain criteria according to which an evaluation takes place is necessary.

"And then there is the third, which is what is called critical sense and judgement, and then I had to, when it was written, try to give an expression, and it means, [...] Firstly, it must have a set of standards[...]" (6).

Detailed knowledge on those evaluative criteria is required; this is always dependent on the object -or situation- under scrutiny. One should take into account the object's specific characteristics, so as to identify the appropriate criteria with which the assessment takes place. Those characteristics refer to the object's nature and its function, as well as to aspects pertaining to the aesthetical sphere.

Hernes gives here a specific example of an object -a vase- and of how to discover the appropriate criteria for its evaluation. One should consider factors of a practical nature, such

¹⁰⁶ See section 'Reform 94'.

as whether it is stable, the location of the handles; those also in relation to subjective factors, meaning whether it is beautiful, symmetrical. Besides, the exploration of the purpose the various elements of the vase have, the reason for which it is constructed in this particular form, for example, is also of an importance.

"[...] then it becomes important how the standards are to judge things. [...] Firstly, which are they, which standards, and there are different standards for different things, if you take this vase here [refers to the picture of a vase on page 13 of the core curriculum] then it is, a standard is how possible is it that it can take [liquid], do we have a measure for it, why, the distance there is an aesthetical standard, why is it we have given it such a form, why is it that we have waterline on both sides, there are such criteria which can be used as a base, so the first question is which are they." (6).

A possible means to obtain the above, is the parallel examination of alternative criteria. In order to find out the reason for employing the particular standards, one can look for the answer on why not using another type of standards. Hence, two cases might emerge; either one discovers other, similar criteria that enable the disclosure of the criteria's function, or one provides incongruent with the object criteria, where the reasons of excluding them are the reasons for choosing the present criteria.

"[...] when you pose a question about which are they, so when you ask why is it not others then. Which alternatives could have been?" (10).

In addition to the *type* of standards to be employed, one should also discover the *origin* of the standards. This requires the elaboration of those criteria with the help of their previous form. One should compare the present and the past form of the object, discover common elements and new ones introduced, so as to identify the underlying principles of the object. This is necessary in order to decide the reason for which those standards were used, the factors and conditions involved in the particular choice. The elaboration of the development of the object's form, in other words, contributes to the acknowledgement of the canons followed to initially produce the object.

Hernes uses an example from music; the past form of the music refers to the classical pieces, and the present one to the atonal pieces. In order to decide for the evaluative criteria to employ, the underlying common factor between those two forms has to be found, as we are dealing with music in both cases. Here it is the octave, the eight basic notes forming a complete musical scale. Once having identified this fundamental element, the evaluative criteria for atonal music can be apprehended. The exploration of the development of music from classical to atonal, can thus provide insight to the purpose the musical criteria serve, why

and how they took their present form. Besides, this examination of the past is necessary, as the modification of the criteria is usually a long-time process, where the original forms are found long back in time.

"The other is [...] where those standards come from. And they are often developed through a long time. If you take such a thing as music, then the most radical atonalists do not plan that one should play very much out of tune, but what we have in common both for classical music and atonal music is that we have a scale. So it becomes important for us to say how, where those standards came from, why are they established, through which process are they established." (7).

The examination of the purposes the various norms serve, includes reflection over the consequences elicited by their application. This could refer to societal canons, for example, and the role certain tacit rules and customs play. Hernes mentions here the dressing code, and its relation to gender roles. The fact that women were not supposed to wear trousers in the old times, signifies hidden purposes that pertain to the inequality found between women and men in society.

"[...] critical sense also in relation to conceptions about where they come from. And why we allow them to have such a strong impact on our lives, I take such a things as...there was for long a conception that the women should wear skirts. It was a standard which remained, and remained for a long time, and in a marked way. But does it have to be like that?" (13).

Similar reflection and elaboration regards for example established societal systems; one should explore the reasons given for their existence, the circumstances under which they were employed, elements that involve investigation from a historical, cultural, and political point of view. Questions pertaining to all those aspects can be posed, in order to elicit a thorough elaboration of the situation under scrutiny. A parallel examination with similar situations or objects is also helpful, as it provides with more perspectives within which to execute the elaboration.

"[...] If we are to have a discussion on 'should we continue with monarchy in Norway?', then it can be correct to know about what have the foundations for the system been, what have the foundations for the special variation we have in Norway been, where we have a king who has more to say than the Swedish king, or less to say than the Danish king in 1860. Then also, should we have counties, should we not have counties, should we have representative institutions at all? Should we organise them in families instead of colonies, relatives, clans [...]" (30).

The identification of the evaluative criteria and their origin, then, includes comparison of the object's present form to the past one, as well as to similar objects. The acquisition of

various perspectives, regarding also the socio-cultural and historical elements of the object, is in certain cases fruitful to the comprehension of the purposes the criteria serve.

Finally the *application* of those criteria follows, under the evaluation of the object. Hernes underlines that in addition to the discovered criteria, some cases require knowledge of an established evaluative method. As seen before, the evolution of the standards is a long-time process; certain traditions are involved. The evaluation of the object, thus, should follow the rules of this tradition, something that is usually learnt by immediate contact with the object, by application in practice.

The example in that case is the appraisal of wine, the way to determine how good wine should taste like. Hernes illustrates the various aspects of the wine to be considered, canons belonging to a tradition with established criteria.

"And the third main question is to learn to use them. And if one takes a totally other case: If you take a thing like wine tasting, [...] how you learn to taste wine. This is not something which one can find on one's own, it is a tradition. We have a whole area of concepts on how you characterise wine, the easiest is to say that it is not sour. But we can almost say at we must learn it by using it." (8).

Simultaneously, it is implied that not all the criteria are of a theoretical nature. The apprehension of wine, for example, includes the sense of taste. One has to involve such bodily feelings and functions, which become tools in the evaluation of the object. Such elaboration, thus, is not a pure mental activity.

Hence, adequate knowledge of the criteria and their context is required in order to apply them. If one is to evaluate an object, like a piece of music, one should know about the aspects involved in the interpretation and execution of a musical piece.

"[...] to use those standards, this means the critical sense of 'do you know that?' (15) [...] I heard a presentation of Vivaldi. Do I know enough about classical music to know if this is properly presented? And it is not just that, to play and finish at the same time, the different members of the orchestra [...]" (16).

Accordingly, critical thinking includes the identification of the evaluative criteria pertaining to an object or situation, the discovery of the purpose they serve, and learning of how to apply them. This is achieved by thorough elaboration of the object's particular properties, as well as the tradition in which it belongs.

"So we have the question, what is, which are the standards, where do they come from, and how to learn to use them." (9).

As mentioned above, critical thinking is involved in the creation of an object or

situation. Hernes indicates that critical thinking leads to an innovation, to the production of a novelty. After the identification of the canons followed and their characteristics, one should not only learn how to use them, but should also try to overcome them, to synthesise them into a new way.

Hernes refers at this point to art, and specifically to Picasso's paintings. He demonstrates how Picasso transformed and altered the extant artistic canons by introducing a novel framework; the latter did not involve the strict rules pertaining to perception and its objects. It was rather a mixture of how things are in reality, seen with the limitations the human eye has.

"Again, if we take such a thing as the development of the painting art as an example, where we had strict norms that it should be figures, and then we brake with it, and give it a completely different form, Picasso, who attempted to make three-dimensional paintings on a two-dimensional surface, not with perspective and all those things, which he also mastered, but by making figures which are simultaneously seen from two widely different angles." (11).

A method to obtain the creation of a novelty, is the examination of the possibility of employing other canons, rules and working forms than the established ones. One should imagine possible alternatives that could be applied on the same object or situation. The role of imagination is thus acknowledged in critical thinking, it is a useful tool contributing to the production of something new.

"So it means that the critical sense comes in that you learn to pose the question; is this the only standard that can apply here, or the only ones? If you were to establish others, what would they be? Again, like atonal music compared to classical music [...]" (12).

In other words, the awareness of extant alternatives is a condition for the emergence of new outputs.

"In order to get the complexity in your head, you must know that it is possible to do it in other ways." (31).

Hernes specifies that the above elaboration does not necessarily lead to the production of a novelty; the examination of the established systems might evoke thoughts and ideas that have been expressed before by others. A further development of those might arise, or as mentioned above, a further understanding of the extant situation is elicited.

"[...] it is not all the thoughts people think that are new. You can say for example 'why is it so that we shall have a government?' which you learn, and must judge according to and all that. Then it is so that, you are not the first who has asked this question. It is a big thought direction, with anarchism as an example in it, new variations of this

type, as chaos theory [...]" (29).

Again, the importance of knowing the core form of those new formulations is underlined. Critical thinking involves the production of novelties and their development by means of overcoming the extant norms, but after having thoroughly examined them.

"[...] the disputing schools in the various thought directions are part of this critical, and must say, that in order to make them, we should know also the variations form, what is the foundation for the various institutions." (30).

The way to overcome the established rules is both a difficult and fascinating one. Hernes feels the products of such a process are of an interesting nature, as they open new horizons of possibilities, new ways of perceiving the same things. Critical thinking, in other words, provides with new perspectives.

"And then it is the difficult question about when one began to brake with, brake with those standards, how it happened. [...] those style-violations are interesting, this that we open for questions." (14).

Despite this presence of openness, critical thinking involves at the same time the already established standards. The students operate on an axis with two edges; the creation of novelties and the use of pre-determined criteria. This suggests the presence of a contradiction regarding the students' training on that point.

"[...] this is the quote from the last part. That training has a number of apparent contradictory goals." (18).

However, this diversity in the process of critical thinking is only ostensible. Hernes explains that the one is a requirement for the other; one must first master the extant established system of criteria and rules, in order to be able to overcome it. As seen before, such knowledge is a condition for critical thinking. Without thorough elaboration and comprehension of the canons employed at present, the introduction of something novel is not possible.

"[...] when we talk about Picasso [...] there is a historical presentation from what he painted first, he painted very much figure-like, so he mastered it completely. The same regards Mattis. (19) [...] we can see how he worked figure after figure, away from the naturalistic and over to what you call the essential in his conception. (20) [...] But both Picasso and Mattis brake with the tradition we are in now, but that does not mean that they did not master it! [...] you must both know it [the past] and you must ponder on it. And then you can end up with working through it." (19).

At the same time as this knowledge is the basis for introducing a new form, it also

reflects consideration for the others' creations. One gets an insight in the tradition the object belongs to, something which prevents it from eliminating in the future. Knowledge and contact with the past are necessary so as to move into the future. Critical thinking, in other words, leads not only to the production of novelties, but also to the preservation of the tradition one belongs to.

Simultaneously, critical thinking requires an attitude of openness to one's surroundings, an attitude of interest for the others' work.. Exclusive preoccupation with and focus on one's own actions and thoughts is counterproductive in the present case.

"[...] And this is the way it should be, my personal view, is that, it is one thing if you just fumble yourself to something else, but I believe that this lies as a form of cultural duty which includes also respect for the past, respect for what the others have thought, openness for what the others have thought [...]" (19).

The aforementioned antithesis, hence, embraces a creative attitude. Mastering of the past accomplishments is a kind of an inspiration for the future ones. Those two ends are both present in the creation of novelties.

"[...] it is contradictory, yes, but it is a creative contradiction. So it does not mean that it can, it cannot be either the one or the other, it must be both." (21).

Besides, this particular way of expressing critical thinking and its content, in the core curriculum, is in accordance with the circumstances met in everyday life. Rarely do we find ourselves in situations of a clear character. It is most usual that we face contradictions in many aspects of our lives, challenges that we have to understand and deal with. This polyphony found in the everyday world reflects the way human beings are, of individual characteristics and idiosyncrasies, with thoughts and actions which are not always in a harmonious agreement. The complexity of the human race, in other words, is in a way reflected in the core curriculum, through the language and phraseology used to describe critical thinking, in that case. As such, it prepares the students for the situation they will meet later on, during their working and personal life.

"[...] I believe at least, that were we to have this conception that pedagogy, that the human life is either one thing, or the other, then I would say; I do not share this view! I will on the contrary say that what is interesting with both the personal life and philosophy, is exactly that we have incompatible –in a way- conceptions, that we have paradoxes which can live side by side and that exactly what makes it interesting is this polarity. If I were to use a nice word about it, and I would actually not use, it is that there lies dialectics. That there is dialectics in the sense that a tension can give creative or surpassing insights or expressions." (22).

Elaborating those two poles of the axis -the use of the pre-determined criteria and the creation of new ones- Hernes borrows an example from art. When learning music, one has to master the established rules regarding its basic components, coding system, execution methods and production of analogous expressions. Moreover, the various means used to produce music, pertain to individual canons and rules, depending on their properties.

"[...] within musical training. Because there we will learn a scale, we will learn a certain typical written language which is the notes, and it has as a rule some beats, you have a whole beat, and a half beat, and a one four-beat, etc. and you have norms that one shall not play out of tune, you know what the scale is, the scale as a zero point, whether it will be a clean stroke A, you have norms how a composition shall be. (23) [...] you also have materialised expression for the instruments that give opportunities, for example, you cannot write a flute concert in the same way as a violin concert, because you must leave space so that you can breath [...]" (24).

Once having acquired this knowledge, direct application of it takes place. The executor of a musical piece uses those evaluative criteria to assess first of all his/her own performance. An additional method is to take as a standard the performance of the professionals of the field, of the musician soloists in that case.

"[...] and you must learn to be able to judge your own performance in relation to this system and how is my violin scratching in relation to Arve Tellefsen [...]" (25).

The presence of others, hence, as a reference point for carrying out an evaluation is acknowledged at that point. A similar case was met above, the other in the sense of acquiring different perspectives by examining the others' work in the past. Critical thinking is an activity which requires more than the self alone.

Returning to the issue of the contradiction embraced in critical thinking, after having gone through the three steps regarding the evaluative criteria, one can move on to the establishment of new norms. The knowledge of the criteria, in other words, does not hinder their being overcome.

"But again it is so that, it does not mean that when you master it, you can't brake with this tradition, so Arve Tellefsen, to use him as an example, has made some compositions which are a radical break, with using the violin just as a sound instrument, that he does 'tsk, tsk' [produces some sounds] while he plays. (26) [...] you can't brake with it if you don't know it." (27).

Critical thinking, in other words, leads to both the comprehension and preservation of the past traditions, and the creation of novelties. An attitude of interest and openness, in addition to thorough knowledge of the past is required. This process involves a kind of a

contradiction, which is on the one hand necessary in order to create something new, and on the other natural to find within everyday life.

The above description of critical thinking pertains to all ages. It is a process attainable by students attending even the small classes at school. Hernes supports the production of novel ideas regarding for example everyday situations takes place at young ages; young age is in fact a factor which enables such a production.

"[...] what I would have as a basis here is that, yes, it is so that children and youth can think of something in quite radical thoughts of how you can organise the societal life and they do that. And this to be young implies also to brake with it" (28).

Moreover, in order for the students to initiate and engage in critical thinking, a strong interest in the area under question is required. This does not necessarily mean that the students should be intrigued beforehand; the role of the school and the teachers is to stimulate the students and motivate them to participate in such a process.

"What is expected by them [the students] is that they strengthen, their curiosity is stimulated." (32).

The way to activate the students' interest, is to involve them in discussions of subjects that they are familiar with. Topics that concern the students directly are more likely to be taken up for the kind of elaboration mentioned earlier. The students are in immediate contact with such situations, thus become curious to examine them.

"[...] then one should present the facts in such a way that they can identify themselves with a problem." (32).

Accordingly, the *application* of critical thinking in the classroom can take the above mode; the students are presented with an issue pertaining to their everyday lives. The example here regards the processes and factors which influence the formation of one's character and personality. Students meet people of various types everyday, even from different countries of origin, with similar or very different habits. The goal in that case is to explore the potential people carry to form different attitudes and behaviours according to the surroundings and circumstances under which they grow up.

Hernes uses here the specific example of a girl of a foreign origin, who though grew up in Norway.

"[...] an example I have often used is about a girl [...] who leads a programme on the television [...] and was a great girl from Trøndelag. And there was a thing which is different from most of the girls from Trøndelag, because she had Korean features. And she had come here when she was four years old, was adopted [...]" (33).

Accordingly, the differences detected in people's attitudes can refer to societal tacit rules, like hair length or dress code, and to personal preferences, like food habits. The students are to comprehend that those factors do not depend on biological or genetic factors, but are actually a product of societal development, they are under the influence of one's environment.

"[...] when she was around 20 years old, she wished to find back her family in Korea. And they did not know who this family was [...] her Norwegian stepmother managed to find her Korean family. So she went back and what she discovered when she went back is that she has Korean features, but is no longer Korean. [...] she has too short hair. The food is very different from what she is used to. The point is that, the meta-learning in this is that in her time, in her body, there can live various lives, do you take in this, were you there, she would have become like them, because she went elsewhere, she became another person. This is how it is with all of us. [...]" (33).

The use, thus, of a familiar to the students example of a situation they most probably meet in their everyday interactions, presented in such a way that intrigues them, is a way to initiate the employment of critical thinking. The students feel curious to discover and understand how the different attitudes and habits are shaped, where they come from, and why they have the particular form. Such an example can lead to further explorations regarding the society and its function, the freedom given to personal expression, the role of the societal institutions, where oneself stands in relation to the present socio-cultural frame.

"And then I can use that concept as an introduction, so as to ask the broader question 'what is the society does with you and your choices?' And then that the choices in Norway are much more. They could have chosen to live in a Korean way in Norway, and people would have accepted it in their majority, it would have been more difficult to live in a Norwegian way in Korea. [...]" (34).

It is hence, the teacher's role to provide the students with such situations, to provoke them into elaborating issues they are familiar with.

"[...] There are a lot of ways to do that. It is the pedagogical challenge, it is to capture the youth, so that they begin to ponder on their own.[...] they shall increase the interest, the engagement." (34).

Hernes specifies that each teacher should accommodate the above procedure to the nature of his/her subject. This will determine how the three components of critical thinking will be employed and applied.

"The main thing is that it will be various ways in the various subjects. What divides the school-subjects is those three levels I spoke about, what are the standards, why are they there, do they need to be there, and the third is how do we use them." (36).

Accordingly, in a subject of a more practical nature, where real articles are involved, the students can be challenged to examine the evaluative criteria pertaining to central aspects of those articles. Regarding specifically tools, Hernes suggests drawing the attention to a spoon, its shape in relation to the feeling created when being held, its endurance and aesthetical appearance.

"[...] so if you take a tool, if you take this plastic spoon, there are many ways to judge it with. If we go in to how one judges a tool, a spoon, it is about: does it 'sit' good in the hand? This is a criterion.[...] Another is whether it is in such a way that it can be easily bent? [...] There is another type of criterion.[...] A third thing is whether it is beautifully formed. You can pose the question: can it be an opposition between them? [...]" (37).

Hernes specifies that the way to identify the above criteria, is by the use of personal experience with the object under scrutiny. This is also why a familiar to the students object or situation should be used. Personal knowledge about the object enables the elaboration of its origins and purpose. Direct experience with the importance of the sharpness of a knife, for example, leads to the identification of this property as an evaluative criterion. We can thus say that relevant personal experience is a requirement for the demonstration of critical thinking.

"[...] And this is something that we can learn, everyone has eaten with a knife and fork which hurts because it is so rough.[...] You have surely eaten with a spoon which has been bent.[...]" (37).

The above also indicates the participation of the physical senses. One has to 'feel' that the knife is rough, so as to realise it is not pleasant to hold, one can 'see' the spoon being bent. The physical senses, accordingly, function as tools for the evaluation of objects, through the feedback they provide, the somatic feelings they evoke. Body, hence, plays a significant role in the demonstration of critical thinking.

Personal experience, or in other words, situations the students are familiar with, need to be used so as to stimulate the students' interest. The examination of the various evaluative criteria and their variations, -meaning their origin, the function they serve, the reasons why some of their aspects were preferred over others, the reasons why they were altered- can hence take place. The above example with the spoon includes discussions around aspects of aesthetical beauty and functionality, what should be prioritised and why. The various perspectives can be explored with regard to their origin and purposes they serve.

"[...] and there has been various thought directions about it, there are some who say that what is very functional, is beautiful, the functional is the beautiful. While others say that it is the ornamented, even if it hurts to hold the spoon in the hand. If it looks very ornamented, then it compensates for the costs by being difficult to hold.[...] and then you

must do it so concrete, you must do that, you can ask the question: OK, where do I have that from, [...] that we shall ornament what we are surrounded with [...]" (38).

Hernes illustrates the importance of initiating discussions around objects we are accustomed to, with another example; the teacher points out objects that their form is taken for granted, and questions the reasons for them being as such. S/he attempts to engage the students into being sceptical to the things around, into investigating the motives and reasons hidden behind their present form. It can be thus said, that critical thinking also involves an inquisitive attitude for one's surroundings.

"[...] why is this desk here so flat and squared? If I see at the old desks, they are ornamented, why did that disappear? It is to wake the interest for all those everyday things –why shall those PC's be beige? Where does that come from? There are no technological-political reasons for it to be beige. And there are some that have begun to brake out of it, 'Apple'. But it was captured into that conception. So I use those everyday examples, to show that there can be a way to wake the interest." (38).

Another way to get the students involved into an elaboration, is by actually letting them produce the object they discuss about. In that way, the students carry the responsibility for choosing the appropriate material and means for the production, they have to decide on which form the object will take, they must identify and explain the reasons for their choices. When presenting their productions in the class, they can discuss the variations given, and thus acknowledge the role of the various perspectives. The fact, hence, that they are in direct contact with the object under scrutiny, makes it more interesting and attractive to them to analyse its various aspects.

"[...] if you use this spoon example, you can make it in another way, make a spoon. Make a spoon! In other words, how does it look, to cut through, to slice up. All together make a spoon for tomorrow. And then I will see what is the reason for which they prefer the one over the other. And if you see at a usual spoon, it can be made like that. But you can also give it a swing, in a way¹⁰⁷. What is the advantage with that.[...] but you can wake the interest for this by them producing it. [...]" (40).

The teacher, in other words, can make use of direct practical application, so as to initiate and carry out a mental analysis. The students use their physical senses, create something with their hands by use of tools and materials. The body, then, contributes to the demonstration of critical thinking, through 'touch', 'look' and 'feeling'. The students receive feedback from their body, which they use so as to analyse the object's properties and

¹⁰⁷ See 'Appendix B', 'Fig.1'

comprehend their function. Moreover, creativity and imagination play a role here, in the discovery of alternatives to the original form of the object. This, in combination with the evaluation -on the functionality of the object, for example- comprise critical thinking.

Moreover, the role of the teacher is to recognise when the students are engaged into such analyses, when the discussion topics are interesting for them. S/he should be sensitive and open to receive various stimuli from everyday situations, use appropriate incidents and circumstances to initiate critical thinking. The particular characteristics and individual preferences of the students should also be taken into account.

"When I started with the beige, you smiled [refers to the researcher]; it is such a recognition, and then I as a teacher should learn when it is that the students smile and get recognition for what I use as an example. (39) [...] But it can be different things for different students. And it will be different things in different situations. If it has been a murder at school, the situation is one, or a traffic accident, then the situation is another. But then you must use the opportunities also to take up important things everyday." (45).

Moreover, elaboration of this type should not be limited to the school frames; it should be transferred to the everyday world. The students are to be intrigued in such a way that they become inclined to engage in corresponding discussions on similar issues under their everyday encounters.

"and it is not something which just happens in the classroom for some hours, but which they ponder about when they go to sleep, or talk about when they are at a party, or ask each other about [...]" (35).

A competent teacher in that sense, is thus the one who does not stay captured within the strict limits of his/her intentions, but accommodates his/her actions to the students' reactions. The teacher has to put the students in front in that case, has to prioritise their wishes and consider what they find as interesting to deal with.

"[...] It is like when we developed the dancing music. It is so that there are some who look at the notes and play the notes, but if you are about to make good dancing music, then you must not look at the notes, then you must look at: is it so that somebody is dancing to it? And so there is some music which attracts the people on the dance floor. Perhaps if it is some 'lambada' it is so that when people hear it, they feel like moving. [...] So in the same way as with the students, if it is a good pedagogue, what is it that captures?" (39).

The role of the teacher is further elaborated by underlying the fact that the classroom comprises of constant interaction between the teacher and the students. This should be present under the planning and execution of the instruction. No matter how well planned and intended a lesson might be, it will not be productive and effective if the students do not respond to it

positively, if they are not stimulated by it.

[...] what you have to do is to take the departing point from the students, in the sense that...what makes it so that you can capture them. (41) I can enter a classroom if I will hold a speech, something like that, and then I know that it has a certain short lifetime. And if I miss that, then I have lost, the hour or the flock. And then I can't do whatever I want. I must do what makes it so that I capture them. And that means that I must be attentive both to what can capture them, and to what I wish to communicate." (42).

Subsequently, the teacher must find the proper balance between those two poles; the knowledge transferred and the students' area of interest. Hernes remarks this is another case of a contradiction, similar to the one met above, under the creation of a novelty. He thus emphasises what he suggested earlier, that the educational reality includes situations of opposition, that one has to learn to deal with.

"And then you can say that it is a sort of conflict, again. On the one side, if I am totally attentive to you, then it is not certain that I taught you something of what I wish to convey. And if I am only concerned with what I will communicate, than I don't think this is enough to understand what it takes to sneak it in, or to provoke you so that you take a standpoint." (43).

However, in the case of absence of a teacher with those characteristics, the students are not automatically condemned to ignorance. They are quite used to being obedient and following instructions within the school realm, something which implies that they will carry out their duties, even if not being particularly motivated to do so.

"[...] the students are simultaneously like good pets, they are in their majority convenient and kind and...even if they wear caps turned on one ear, and all that, like put their legs on the table [...] They are in their majority convenient and tolerate most of the things. [...] (46). I had to do this sometimes I lectured myself, then I put on the wrong numbers, then I say one thing and make an overhead that shows something else. So that I can see if there is someone brave to say something against me. It is very rare that they do." (47).

So far, two cases where the application of critical thinking can take place in the classroom have been illustrated. The first regards the elaboration of a topic familiar to the students, pertaining to societal or everyday issues; the second refers to the execution of a practical assignment. Two requirements have been identified until now; personal experience with the object under scrutiny, and the teacher's attitude. The latter concerns his/her ability and will to stimulate the students' interest into the subject under discussion.

Still, critical thinking is not totally dependent on the teacher; the students are also expected to fulfil certain requirements. Those expectations refer to the use of knowledge and abilities the students *already* possess.

"[...] most of them know much more than they are aware of." (48).

In clarifying the above further, Hernes indicates that seemingly complex issues can be broken down to more accessible and understandable parts that the students possess knowledge about and can deal with. The teacher's role is to make this evident to the students, even to the youngest ones, so that they will use their coherent experience to elaborate similar problems.

The example given here refers to mathematics. Hernes illustrates how an initially perplexing task, the creation of a square of a specific size, can be quite easily solved by reference to the basic, elementary properties of a square, which are well known to the students.

"[...] here we have a square¹⁰⁸. And you want to make a square which is exactly half the area. How I will do that. It is a controversial mathematical problem. You know the answer. I will show you that you know the answer. You divide it in four. Here are four squares. So I divide this in two, then this part is the same as this part. So I take away that half part. And I do the same here, and I take away that half part. You know it.[...]" (49).

What the teacher does, hence, is to enable the students become aware of their own knowledge. S/he helps them to identify and organise knowledge about the object that they already have; she empowers them to see their personal experiences from another perspective.

"[...] And then I make you aware of what the criteria to judge a tool with, are. (37) [...] It is just that I showed you that you know it.[...] It is just to find an assignment, almost like to develop a film, to develop your own consciousness that you know what I have tried to tell you. And this regards also six year olds and seven year olds –they have a lot of experiences [...]" (49).

The adoption of the appropriate teaching and learning methods which enable development and demonstration of critical thinking, depends on the nature of the subject involved, as well as the level of the students' education. The latter addresses the type and amount of knowledge the students possess, which should be taken into account in order to design the presentation of new knowledge. The teacher should also identify in what area an analogous insight is absent, and promote it accordingly.

"[...] if I shall do that systematically in a subject, then it demands much more pondering than those improvisations which I know make, and it demands that I think not only about the subject, but also about which class they are, what the students know from before and what is it they know, that they are not aware of." (70).

At the same time, Hernes underlines that the quite complex acts people of a young age

¹⁰⁸ See 'Appendix B', 'Fig.2'

are capable of performing, are usually taken for granted, or not acknowledged. The teachers should be sensitive and attentive to skills and abilities we often consider natural, and which are not valued properly. What is needed is a realisation of the importance of the students' extant qualities, and an emphasis on their usefulness.

"And there is incredibly much the youth can, this with walking, for example, to walk is very difficult. And to try to teach grownups who have been victims of a traffic accident to go, is extremely difficult.[...]" (71).

The teachers should thus utilise such knowledge, and promote its application in accordance to the circumstances of the given situation.

"[...] So there is a lot you know, and it is only to use it, but in which order shall it be done. Do you have to learn whole subjects, as you learn sections of" (71).

The crucial point is thus to decide which information should come first, what is the basis where more complex issues can build upon. Once absorbed and apprehended, extant basic knowledge should be taught to be applied in a novel way; critical thinking is thus promoted, in the sense of overcoming the established frames.

"And it will be too difficult to start at geometry with the proof on Pythagoras, it is too difficult, you have to begin somewhere else. For example with triangles.[...] as soon as they have learnt a triangle, this that it adds up to 180 then you can say 'OK, do some homework: make a triangle which is more than 180.'" (73).

Hernes demonstrates that this way of presenting knowledge addresses even the most complicated issues, like the Pythagoras theorem in mathematics. The essential element is to discover a simpler way to present and analyse such perplexing issues, by use of and reference to the students' own knowledge base and experience realm.

"If we look at Pythagoras, the proof of Pythagoras. It looks more difficult than it is, because you are forced to use drawings. But there is a variation of this proof on the Internet [...] And then the proof becomes much easier to see when you have another technique.[...]" (50).

Hence, the teacher should choose those techniques that both enable the students to comprehend new knowledge with the use of the old one, and stimulate them to become involved in analogous elaboration. As seen also above, the reference to objects and situations pertaining to everyday life, is a fruitful way to motivate the students.

Hernes provides with an additional example, where the teacher borrows the form of a known building from the ancient times, in order to examine a mathematical formula. The

theoretical analysis, then, is made through the use of a practical application. The students are curious to investigate the problem posed, as usually the old constructions are fascinating, both due to their age and the unknown details surrounding their construction.

"[...] If you go to Acropolis [...] these fantastic, those Greek buildings, because what they have done is that they made them to stand vertically. And they stand so solid vertically, that they have been there for a couple of thousand years.[...] And then there is the question: how do we make things to be vertical? How do we do that? We get a rope and then a metal weight which hangs from there¹⁰⁹. And then we compare with this metal weight that hangs, then it will be vertical. So it is not that difficult. [...] But if we look at Acropolis, it also has flat floors, a horizontal floor. And how do I find out that something is horizontal. Homework for tomorrow.[...]" (52).

Hence, what initially is a meaningless, perhaps, mathematical theorem, becomes an interesting problem to be solved. The students are intrigued to contribute with own ideas and suggestions, to discuss various aspects of the problem, in other words to engage into an elaboration. The above refers to the transformation of knowledge into something handy, into something the students might have use for and could make immediate connections to, under everyday situations. This way reinforces both the will to learn and the comprehension of knowledge, as it becomes apparent that it can be actually applied on a practical situation.

"[...] And after I became curious about that, how we do it, then I found out six different solutions, and the Greeks had one.[...] We could have done it by referring to the horizon. But the Greeks [...] made an A^{110} [...] And those legs were of the same length on each side. So the question was how shall we use this A to make something vertical.[...]" (52).

This concerns, hence, the skilfulness and will the teacher shows into utilising the abilities and skills the students already possess, and into applying them on a familiar object or situation, so as to elicit comprehension of more complex knowledge issues.

"[...] What is interesting here is that this is based on a mathematical theorem, that if you have an angle which is divided in two, and you have equal legs, then [...] the half part will go in the middle.[...] And this you can show by initiating from [...] all that there.(55). [...] this can be used as an introduction to mathematics. And when you have understood that introduction, then you can build new upon. [...] This is more complex, but in no way unachievable. It just looks worse." (56).

At the same time, Hernes underlines that also the teachers should become aware of the knowledge they themselves possess. They should make use of the experience they have, which can enable them to identify when learning is successful or not. A factor taken under consideration here, for example, is the time teaching takes place in relation to the students'

¹⁰⁹ See 'Appenix B', 'Fig. 3'

level of development.

"And it is a lot the teachers know that they don't know of. Because they have tried a lot of times and they know when they arrive too late in the students' development, and then they believe it is very boring, because they have heard it before, or they come too early and they don't master what they get." (72).

In other words, the teachers already know how to identify the type and level of information the students are interested in and ready to process. They have the experience to choose and promote the proper material for the students to elaborate, and thus demonstrate critical thinking; the crucial point is to achieve an insight.

Returning to the use of the students' extant knowledge, such a process can be followed even for the total elementary concepts on which further knowledge builds upon, like the positive and negative numbers in mathematics. Hernes illustrates how the children's extant knowledge can be used in presenting such a concept; it consists in applying it on a new situation, which however maintains the same known framework of rules. The students can thus make the connection between the old and the new knowledge quite easily, at the same time as they realise the possibility of using knowledge in such a radical way. Besides, the awareness of alternatives, the aforementioned requirement for critical thinking, takes place in that sense.

"[...] When you count, we say for example that $2+2$ is 4. Then you use whole numbers, you use the fingers.[...](60) So I can pose the question: I can add and subtract. What if I have two fingers and subtract four? Then the conventional answer comes, that it is not possible. [...] But the critical will say, OK, if this is the situation, then we make some new numbers, we make a whole set of new numbers¹¹¹. [...] We can call them negative numbers [...] except the fact that they are totally new numbers, they were not there before we made them up [...] so we have created as many new numbers on the other side, behind the mirror. And we just pose the demand that they will behave in the same way as the other numbers do.[...]" (61).

Accordingly, critical thinking under those circumstances regards the utilisation of one's extant knowledge into overcoming the established rules. Once learnt, the various objects and situations can be transformed into something new, which is radical in relation to the initial standards governing the object. A way to achieve such a surmounting, is to combine, for example, knowledge from various areas in a new synthesis.

"[...] I will show you an example of critical thinking in mathematics. Here you have a triangle. And [...] if you sum up the angles in a triangle, you get 180 degrees. [...] Critical assignment: can you make a triangle with more than 180 degrees? [...] You must brake out of the

¹¹⁰ See 'Appendix', 'Fig. 4'

¹¹¹ See 'Appendix', 'Fig. 6a, 6b, 7'

conception that locks you in this." (57).

Critical thinking in this case includes dealing with a known issue by adopting a different perspective, by combining knowledge areas in a new way. The student must use both knowledge and imagination so as to come up with a suggestion to the above. The particular example refers to the use of geometry not on a surface, as is the usual case, but on a sphere.

"[...] Do you want to see a triangle which is 270 degrees instead of 180? I draw a ball. This is the earth¹¹². So you have the equator here. So I take 90 degrees from here. And here you have the pole up. And then I will draw a meridian up here, and a meridian up here.[...] Exactly here, it will be 90 degrees. And here it will be 90 degrees. So this distance is the same, 180. But up here it will also be 90 degrees. Because now you don't have a geometry on a level, but on a sphere.[...] (58). [...] So we can make very many different geometries, depending on what we make them on." (74).

Accordingly, critical thinking requires application of the theoretical knowledge on issues that are interesting for and familiar to the students. The extant knowledge should be used in order to present new one, where the complex concepts are broken down into simpler parts the students are able to deal with. The concrete demonstration of knowledge into actual application contributes both to higher motivation for learning and comprehension. The crucial point is the contribution of the teacher into making the students aware of their own knowledge; this is the only expectation regarding the students. The final aim is to overcome the given frames and create something new.

The introduction of a novelty requires also previous demonstration. Knowledge of the origin and present form of the object is not adequate by itself; the students should be shown the actual process of conquering the established norms. The teacher, in other words, should provide with an analogous example, which will function as a model for further application.

"[...] what they [the teachers] must do is to give you examples of how you can brake" (59).

The aforementioned case of the negative numbers, for instance, enables the students to realise the various ways knowledge, facts and rules can be used, the various forms and expressions they can take under the approach of a problem. They learn, in other words, the mechanism of using their extant knowledge in new ways, of surmounting the given frameworks.

"We have suddenly created a totally different thing, because we brake out of the thought-prison we are in, as long as we just think about the fingers." (62).

¹¹² See 'Appendix', 'Fig. 5b'

Consequently, the attitude of the teacher is of the utmost importance for the development and demonstration of critical thinking, as the initiation of the above process depends mainly on him/her. However, this attitude is not totally dependent on the teacher's natural tendencies and abilities to apply the above. This particular way of carrying out the instruction is an object of training.

"[...] but the teachers can learn that. Those things that I have used here, you can use them also." (63).

It is implied, in other words, that the education the teachers receive should include such techniques, if critical thinking is to be promoted in the classroom. However, Hernes believes this is not the case at present. He is under the impression that the educational institutes which train teachers do not address those issues.

"But they are not dealing with such things, after my opinion, almost not, at the teachers' schools. [...] They don't." (64).

The exclusion of such matters, which pertain to the core curriculum, implies an incomplete understanding of it. The educational institutions have not realised the gravity of the document's content; usually attention is rather paid to the technical, external characteristics of the core curriculum, and not on the deeper meanings conveyed. Hernes refers to the comments made about the language used, instead of concentrating on the instructional process required to achieve the goals included.

"[...] And that means –it is because they have not understood the core curriculum. And they have not understood it, because they have not worked on it. They have read something. So they will hang a little bit on some superficial things, like that a somehow archaic language is used [...] instead of saying what it is actually one should do with a project, how shall we do it? How shall we do it in the classroom?" (64).

The reason provided by Hernes for the above failure in capturing the real essence of the core curriculum, is an unsuccessful communication between the Department and the teachers. The intentions and content of the core curriculum have not been made known to the teachers in an ample way, in-depth discussions between them and the Ministry of Education have not been conducted at a satisfactory degree.

"[...] we can say it in another way also, that if the educational institutes for the teachers have not understood it, and the teachers have not understood it properly, and the teachers cannot carry it out properly, then it is because I have failed as a minister! Who did not manage to communicate enough what I was actually intending." (66).

The complete comprehension of the core curriculum then, and subsequently of the phenomenon of critical thinking, requires an adequate communication between the parts involved. The meanings conveyed and the underlying intentions need to be analysed and discussed at length, for full apprehension to take place.

Hernes clarifies that the goal with the particular presentation of critical thinking in the core curriculum was to highlight the interesting part of learning, meaning the exploration of everyday objects and situations under the light of a new perspective. What makes learning an amusing, a pleasant activity, is the investigation of the reasons hidden behind established norms and forms, behind things we take for granted.

"And this is what I intended. They are very exciting learning models [...] and what makes it fun to learn things, is exactly that, that people do so many things and have come up with so many things, and made so many things...beige boxes, for example, very weird that they decided that they should be beige...why, why not white [...]" (67).

Parallely, Hernes indicates that the responsibility for controlling whether the core curriculum is applied at schools lies at the educational office level, and on the people employed there. They are in charge of examining the lessons at school, whether the instruction takes place according to the guidelines of the core curriculum.

"I believe that it should absolutely be an assignment for the educational directors, and those who work there, to say to what extent the core curriculum is accomplished through the actual instruction" (68).

Specifically, the way to investigate the above is by conducting analogous discussions with the pedagogical personnel. The teachers should present techniques and methods applied to achieve the application of the core curriculum; such contact should lead to the discovery of ways to obtain the goals involved.

"and then they will also know what one aims at, and it regards exactly this type of discussion we have now [...] With the teacher. To discuss all those things, how is it we can do it." (69).

Besides, at the school level, the leaders also have a duty to be involved in the instruction, in the classroom reality, at the same time as they carry out assignments of a more administrative nature. Hernes specifies this is not translated in the setting up of an obligatory mode by which the instruction should be carried out, but rather in the establishment of a close contact with the teachers. Corresponding discussions on how to build up the lesson should take place, where each teacher chooses the best way in accordance to his/her own particular characteristics.

"[...] they also have such a kind of duty, they are school leaders. Because they shall actually lead. It is kind of pedagogical, but not in the sense that a teacher forces others his/her own conceptions, but at least engage the teachers in a proper debate. How shall they do that?" (75).

Finally, Hernes remarks that the educational ideas and techniques should be constantly adjusted to the present characteristics and qualities of the students, as well as the extant circumstances. Development in the field should occur in relation to alterations in peoples' ideas and behaviour. It is education that should be accommodated to the students, and not the opposite.

"Because pedagogy is not a stagnated filed of study, it is something that is all the time under development, and should be under development, because the students change. If you take the pop songs that the rapers have, they include other texts than Melina Merkouri [Greek actress and singer of the 50s-60's]. It is another world, you must behave in relation to the world as it is, but not what is your own world." (76).

To sum up, Hernes's description of critical thinking in the core curriculum addresses the tradition of creating. It involves the presence of evaluative standards; the students have to identify them, elaborate their origin and purposes, and learn how to apply them. This requires knowledge of the object/situation the criteria refer to, consideration of the object's particular characteristics and of the tradition involved, comparison of its past and present form. Critical thinking evokes a surmounting of those standards, in the sense of introducing a novelty. Both solid knowledge of the extant norms and awareness of possible alternatives is necessary; this pair is viewed as a creative contradiction. An attitude of openness and interest for the others and their work is also required. Finally, critical thinking enhances the understanding of the current object/situation, contributes to the preservation of the tradition, and uncovers new perspectives.

Regarding the application of critical thinking at schools, four cases are identified: the use of an object/situation familiar to the students; direct reference to practice; the use of practical assignments, and the presentation of new issues by utilisation of the knowledge the students already possess. It also involves an inquisitive approach. The application depends initially on the teachers' attitude, who have to be willing and able to apply the above, as well as sensitive and receptive enough to accommodate to the present circumstances. Demonstration of how to overcome the extant standards is also a task for the teachers. Besides, the nature of the subject influences the particular way this application will take place. Finally, the students are expected to become aware of their own skills, abilities, and

knowledge, something which again lies on the teacher to promote.

What follows next, is a parallel examination of the gestalt of meanings conveyed by Hernes and the participants from the two schools.

Starting with the *perception* of critical thinking, it is initially remarked that none of the participants refers to all the three components Hernes indicated. Fragments of them are found in almost all the descriptions, but none of them includes them all. The usual case is that the *elaboration* of the standards and their *application* is emphasised. Almost none of the participants refers to the process of identifying the proper evaluative criteria to be used.

Most commonly, the students are given pre-established criteria to carry out an evaluation with, be it the syllabus goals or the rules governing the particular type of work. FO for example, uses the perception laws included in drawings, or chooses goals out of the syllabus to be achieved. The students do not seem to be involved in any process that signifies exploration of the learning object and its characteristics, which would enable them to arrive at own conclusions regarding its evaluation. The student of DD says characteristically that they are almost never given access to the original objects they discuss about, in order to properly examine them. The only exception here is the teacher of DD, who indicates that the nature of the criteria requires learning via experience. The students must participate and watch a theatrical performance, so as to feel the emotions evoked, to discover the correct use of the body and voice. In their majority, though, the students seem to follow pre-determined standards; they do not participate in the identification of the criteria.

Otherwise, the participants refer to the elaboration of the standards given, in relation to their origins and purpose they serve. FO and DD talk about investigation of the working process followed; they refer to the exploration of the tools and means used, the reasons for the particular choices, the consequences on the final product. This investigation resembles highly what Hernes considers as the discovery of the purposes the various criteria serve -why for example the spoon has the particular shape. Participants from School 2 also refer to the process of making the proper decision in order to solve the problem faced, something which implies knowledge of function the various tools and components of the object have. The students of AA bring up the issue of examining the knowledge and information acquired, addressing its truthfulness and reliability; in other words, the origins and purposes it serves are investigated.

Hence, almost all the participants refer to what Hernes illustrated as the elaboration of the object and its evaluative criteria, from within the individual frames of their subject. A divergence found here concerns the *extent* to which the students are responsible for this

process, the freedom and opportunity they have to carry out this exploration by own means. Hernes mentioned for example the comparison of the past and present form of the object, the use of alternatives. Some participants indicate the use of additional informational sources; they offer another perspective, and can thus be said to function as alternatives. However, as hinted also above, the most usual case is the presence of specific goals to be taken into account. The criteria given answer to these goals, and the students' role is limited into comprehending the connection between them. As the DD 2 student says, they have learnt the elements they should be attentive to when executing an assignment, they have not discovered themselves the reasons why this is so. School 2 is also a quite clear example; the main weight is put on the process of learning the correct action, the students use the pair try-fail in order to find the proper thing to do. The in-depth elaboration of the particular characteristics of the object and its variations that Hernes indicates, does not actually take place.

With regard to the third component, the majority of the participants includes reference to training on how to apply the evaluative criteria. The teacher of FO refers extensively to the various types of evaluation going on, DD illustrates in detail the way to apply the criteria involved under the evaluation of a performance, and School 2 pays particular attention to the training on how to assess the indicative factors and arrive at a diagnosis.

It seems, thus, that the participants are mostly concerned with the third component of critical thinking. The students are not so extensively involved in the identification and elaboration of the proper criteria to be used, but rather receive training on *how to use* them. This evaluation is seen as a major part of one's work, be it assessment of a drawing, or of a car repair. The evaluation carries a particular significance, either due to safety reasons -as for example in the case of School 2- or due to the importance of learning how to achieve good results, so as to move further on in one's educational and professional future.

Accordingly, what follows after having mastered the criteria and their application, is experienced in quite a different way by Hernes and the participants. Hernes views the surmounting of those extant rules as a significant part of critical thinking and its employment. He illustrates the use of alternatives, the synthesis of knowledge into new forms, so as to introduce a novel item or situation. This is in a way the final aim, it is what makes the previous elaboration interesting. The school participants, however, do not make any references toward that direction. Despite the attention paid to the comprehension and mastering of the extant rules and norms, the other side of this axis, the creation of something new is not emphasised as much. In some cases the opposite is even indicated, like when the male FO student describes the risk involved in attempting to introduce an innovation. The

harmonisation with the teachers' expectations which quite a lot of students mention, reinforces also the above. The emphasis paid by school 2 to acquire routines, automated ways of working, for example, does not suggest any actions taken toward the introduction of a novelty. Rather, the main goal of the schools appears to be the training of the students into using effectively the extant canons and rules. No further development of them is included.

Thus, in general terms, Hernes conveys two senses of critical thinking; one *situation/system-bound* and one *beyond/outside the system*. The first refers to the assessment and evaluation by use of pre-determined standards. Those could be the established norms, the working rules, the teacher's and the others' work. Critical thinking here is comparative, in relation to human standards, can be said to pertain to the context of verification. The second sense of critical thinking comprises of moving outside the system, creating something new by overcoming of the extant framework. Critical thinking, thus, is in relation to possibilities and alternatives, pertains to the context of exploration and discovery.

The participants in their majority, however, perceive and apply critical thinking in the second sense. The elaboration of information, the evaluation of one's work, the assessment of the working situation, is done based on situational/contextual rules and working/system canons. The participants mostly operate within the verification context, as the surmounting of the extant norms is not a clear goal included in the demonstration of critical thinking.

Hence, the aforementioned paradox concerning Hernes's use of pre-determined criteria and overcoming of them, seems to concern rather the rest of the participants; they convey, namely, a double message. The students are expected to follow the rules, the formal pattern and known standards, at the same time as they are supposed to be 'critical', exercise 'criticism' and express own judgements. They are encouraged to come with own contribution, be creative and productive, within, though, the given framework.

Critical thinking according to the participants is thus finite and restricted, whereas according to Hernes is infinite and unlimited.

Regarding now the requirements for critical thinking, Hernes highlights the *knowledge of the object* under scrutiny; this is acknowledged mainly by the teachers. Almost all refer to the fact that the students should have experience with the issue they work with, in order to be able to carry out a proper examination of it. However, while Hernes signifies knowledge in the sense of personal everyday experience, most of the participants refer to the theoretical area of knowledge the object belongs to. The teachers of School 2, for example, underline the importance of being familiar with the way the car systems function from a theoretical point of view; or the teacher of FO underlines the importance of knowing the tools and material used

in order to create and evaluate an item.

The exception here is the two principals, as they refer to the use of knowledge stemming from everyday experience so as to check the correctness of one's work by discovering the degree of consistency it has with everyday reality. The examples of the mathematical calculation of the price of an eraser, or the volume of a cap, refer to that. Still, the principals acknowledge the importance of everyday experience only in the cases where the assignments given are of a character that pertains to real life situations. Hernes, though, does not set this kind of condition.

Parallely, the participants signify elements of a common nature. Critical thinking is identified as promoting understanding and insight, in agreement to Hernes. The attitude of openness and interest for the surroundings is also detected in some of the participants. Not all, though, include such factors in their descriptions.

To sum up, Hernes has a more comprehensive perception of critical thinking than the rest of the participants. The latter namely, do not acknowledge all the components Hernes refers to, and do not elaborate them to the same extent regarding the content of the processes involved. The final intention critical thinking carries -the arrival at a breakthrough- which provides a radical alternative, is not part of the participants' experience.

When the *application* of critical thinking is concerned, the four cases identified by Hernes are again found in the participants' experiences in a scattered way.

Starting with the use of a *familiar* to the students situation, that the students have direct experience with, it is mainly the principal from School 1 that includes it. The creation of assignments that address such an experience is what she views as a way to enable demonstration of critical thinking. Otherwise, the other participants appear not to acknowledge the usefulness of the students' personal everyday knowledge in that sense.

Hernes considers the above as necessary also in order to motivate the students toward the examination of an object or situation. He underlines the significance of using issues that the students find interesting, so as to introduce theoretical concepts and initiate discussions. The students, however, do not refer to such occasions; they rather focus on the *opportunities* they are given to carry out independent analyses and evaluation, but not to the use of familiar to them situations. The same regards the teachers; they do not mention this method as part of their lessons, where the focus is directly on the object of training.

Moreover, a main difference emerges here; Hernes regards the motivation of the students as the main task of the school, whereas the teachers hold it as a requirement. The students are expected, in other words, to show motivation to learn and interest in the issues

examined, in order to engage in critical thinking. School 2, for example, indicates this clearly, with both the teachers and the principal attributing directly some of the difficulties faced to the lack of enthusiasm from the students' side. The fact that they show low motivation and almost no interest in the learning process, is a factor influencing the application of critical thinking. A student from School 2 also hints at that, when referring to the consideration of the negative consequences of the job, meaning it being boring.

Accordingly, the departing point of those participants and Hernes is totally different. In the first case the students are held as being mainly responsible for showing strong will to participate in the elaboration of the subject, whereas in the latter various ways to intrigue the students are the main focus.

The above is connected to the *role* of the teacher conveyed by the application of critical thinking. Hernes maintains the teachers are the ones who principally carry the duty to stimulate the students toward the employment of critical thinking. They should first identify and choose themes the students are familiar with and interested in, and use them accordingly in the lesson, so as to approach different issues. A number of characteristics and attitudes the teachers should have are illustrated by Hernes, as for example sensitivity, receptiveness, openness. The students' wishes and interests are viewed as the main axis around which the intentions of the teacher should be built. The main requirement posed on the students is exactly this, to become targets of a motivation agenda.

Not all the participants, however, convey the above with their description. The students, for example, chiefly ask for opportunities and circumstances allowing them to demonstrate critical thinking. They refer to the teachers' attitudes and the school milieu as the main determinants of their own acts. The teachers, on the contrary, do not acknowledge the gravity of their own actions in the demonstration of critical thinking by the students. They mostly indicate lack of initiative from the students' side, lack of analogous motivation. The principal and teachers of School 2 are again a characteristic example. They depart, in other words, from the students, whereas Hernes indicates exactly the opposite.

The same situation is met when the other conditions the students are expected to fulfil are examined. Hernes underlines that the only demand posed on the students is that they become aware of the knowledge they already possess. He suggests that the teachers should utilise the proper instructional techniques, so as to make the students conscious of what they know, and how they can use this knowledge to their benefit. Age or performance do not play a chief role. The teachers are to realise the students are capable of many tasks, that they have a number of skills and abilities to demonstrate, when given the appropriate stimulus and

opportunity.

The teachers, however, do not attribute the same degree of proficiency to their students. They namely complain about the students' low level of abilities, about the lack of the knowledge required to carry out the assignments successfully. The teacher of AA, for example, refers to the biologically determined low abilities most of the students have, which do not enable demonstration of critical thinking. The principal of School 2 underlines the fact that the students suffer from learning difficulties, something which influences the degree to which they can employ critical thinking.

Likewise, Hernes's third case of critical thinking application at school, is not always present. Hernes suggests the presentation of complex knowledge in such a way that addresses the knowledge the students already have. New knowledge should build on the old one, so that the students can make clear connections and achieve understanding. This regards again the use of the students' extant propensity, in a way that leads to further development.

The only one who hints at the above, is the principal of School 1. She illustrates the use of assignments that ask for connections between the various knowledge areas, for an integration of what the students learn from different subjects. It should be also mentioned here, that this principal is also the main exception to the aforementioned focus on the students' abilities. She tries to provide the students with the opportunities to develop their own capacity by the introduction of specially designed programmes, which promote student active participation. The content of those lessons imply a freedom given to the students to choose for example issues they are interested in, instead of being imposed something by the teacher. No reference is made to the students' level of proficiency, but rather to the extensive discussion with the teachers on how to best achieve the above.

The same kind of agreement is also found between School 1 and Hernes's description regarding the fourth way of applying critical thinking; namely the use of practical assignments. Hernes illustrates how direct reference and use of a practical situation or even object enables the demonstration of critical thinking. The principal from School 1 supports the same, as she sets the execution of a practical assignment as a requirement for the application of critical thinking. Besides, FO and DD which comprise mainly of practical tasks, appear not to face particular hindrances in the employment of critical thinking. School 2, however, is an exception, where despite the practical orientation of the training, critical thinking is almost not present at all.

The above leads us to the next difference detected, meaning to the presentation of the subject's nature as a factor determining the application of critical thinking. Almost all the

participants of School 1 suggest that when the subject comprises of certain characteristics, critical thinking is difficult, if not impossible to be demonstrated. Those include a pragmatic character, the presence of strict rules, the volume of the syllabuses to be covered, the exam goals. It is indicated that AA, for example, does not allow such an elaboration, as firstly the content of the subject is not easy to be presented in a practical way, or as the amount of the learning material to be covered is so large, that it does not leave the time necessary. The principal also refers to mathematics, where the only way to apply critical thinking is by use of everyday situations. The students express an inability to see the possibility of demonstrating critical thinking under the learning of a new language. The principal from School 2 maintains critical thinking is not a focus of the training, as the exam goals are prioritised.

Hernes, however, does not attribute the above to the nature of the subject. He indeed refers to the subject's character as a condition, though not for *whether* critical thinking can be applied or not, but for *how* it will be applied. The three components, namely, take a different form and expression depending on the particularities of each subject.

Parallely, Hernes clarifies that the teachers can actually learn how to carry out the lesson in such a way that critical thinking is promoted. The teaching schools are the main carriers of such a training, which he however believes does not take place at the moment. This observation is reflected in the way teachers from both schools think and act, in the kind of factors they hold responsible for the demonstration of critical thinking. As mentioned before, the consideration of the students' abilities or the type of the subject as the main determinants of critical thinking, for example, might not have been so strong, had the teachers had a type of training indicated by Hernes. School 2 comprises mostly of teachers who come directly from the working life; their attitude toward critical thinking implies not having received the above kind of knowledge.

In addition, Hernes clarifies that the way to arrive at a novelty, the way to surmount the extant rules and standards, should be first demonstrated by the teachers. The students need this kind of modelling in order to acknowledge the procedure involved, and be able to apply a similar technique in future occasions. Still, the main tendency found is that the students are expected to already know how to deal with issues addressing the demonstration of critical thinking, or are assumed to know best. Such remarks are made from both students and teachers. This refers again to the main focus being on the students and what they are capable of, instead of the teachers and what they can offer.

Finally, the ones in charge of controlling the inclusion of the above techniques in the instruction are among others, the school leaders. Hernes maintains that this should be one of

their main assignments, in addition to the administrative work they execute. Both principals agree on this point, but the actual degree they carry out this examination differs. Principal 1 has a more direct experience with the classroom situations, as firstly, she is teaching herself, and secondly, has a close contact with both teachers and students. Principal 2, though, misses the direct access to the students' experiences, as she does not teach, and does not have an established meeting activity with the students.

Otherwise, common elements involved in critical thinking are also detected. The role of the other and of the body are acknowledged; creativity and imagination are considered useful tools. Critical thinking is not a purely mental, logical activity, but involves exchange with others and feedback from the physical senses.

Summing up the main findings, the following observations are made:

- The experience of critical thinking is indeed situated; the particularities of each subject influence the perception of the phenomenon, as well as the way it is applied.

- A major finding addresses the sense of critical thinking conveyed; Hernes indicates it can also be infinite and open, within the context of discovery, whereas the participants refer to it as being only finite and restricted, within the context of verification.

- Another chief difference concerning the main determinant of critical thinking application, is found between Hernes's intentions and some of the participants' perception. The first underlines in numerous occasions the teacher's role in the initiation and promotion of critical thinking, whereas the latter is preoccupied with students' skills, abilities and level of knowledge. When such requirements are posed for the demonstration of critical thinking, unavoidable hindrances emerge. The students' potential is not utilised to its full extent, and an attitude of helplessness from the teachers' side is evoked.

Such a belief shifts the focus from how to make *teachers* more capable of applying a favourable to critical thinking method, to how it is possible to treat the *students* and the problems created by them. On the contrary, the gestalt of meanings conveyed by Hernes indicates that it is the teachers that need to be dealt with, and not the students.

- Remaining in the same area, it seems that the students are closer to what Hernes intends with the particular reference to critical thinking. They attribute more responsibility to external to them factors, meaning to the school milieu and the teachers' attitude. It appears that what they face and perceive as an obstacle is not acknowledged by teachers and administration in all the cases.

- Hence, it is quite clearly indicated that we are dealing with a *communication* problem between the parties involved. As Hernes suggests, the gravity and essence of the critical

thinking paragraphs in the core curriculum have not been understood to their extent by the teachers. He acknowledges not having communicated his intentions clearly or sufficiently enough. This seems actually to be the case with the present schools. Had the teachers and principals realised the power and significance of the proper instructional techniques to the employment of critical thinking, the above mis-focus on the students' abilities would not have taken place at such a degree. The difficulties School 2 faces would probably have been decreased, had the teachers received special training in the particular area. If the teacher of AA was familiar with the requirements posed, she wouldn't have felt unable of offering any analogous help.

Accordingly, what has been suggested earlier in this paper, is repeated here. The differences detected in either the perception or the application of critical thinking among principals, teachers and students, are attributed to the inefficient or unsuccessful communication between those groups. The main beliefs, conceptions, focus, and goals addressing training, and in particular critical thinking, are not clearly made known to all. Certain illustrations above suggest the lack of access to the students' experiences, or misunderstandings between some teachers and the principals.

Hence, the degree and content of the interactions taking place within each school are an indication of similar to the above differences, regarding issues as critical thinking. As Hernes suggested, one of the reasons for this incomplete understanding is the non thorough elaboration of the core curriculum. This can actually be detected when examining School 1 and 2. In the first case, the core curriculum constitutes the main focus of the school, where analogous programmes are put in practice to ensure its application. At the same time, solid communication patterns including also the above are established. As a consequence, the data indicate a considerable affinity with the Department's intentions. With all the exceptions included, in general lines, School 1 seems to address critical thinking as presented in the core curriculum.

On the contrary, School 2 does not present the above pattern, as the syllabus' goals are prioritised over the core curriculum. The school concentrates in communicating with the teachers, who also emphasise the syllabuses. It is apparent that critical thinking has not been an issue of discussion at school; the concept is unknown to some of the students, or is even mixed up with acquiring efficient working techniques. Its actual applications within the school reality is not being assessed systematically, as students are unaware of the teachers' intentions, and teachers of the students' beliefs.

The significance of having a clear communication in such cases is also demonstrated

when considering the information flow toward the opposite stream; from the participants to Hernes. As seen above, some practical reasons for which critical thinking is not applied, are not acknowledged or referred to by Hernes. The fact that the amount of the learning material dictates the type of instruction and activity the students can execute; the significance of the exam goals, which might promote reproduction of knowledge and not elaboration of it, are two cases overlooked by Hernes. Moreover, Hernes was capable of providing with examples of specific ways to apply critical thinking, even in those subjects where the participants thought it an impossible assignment. The latter's experience and difficulties faced into doing the same, are perhaps not totally known to the Department to their full extent. Hernes recognises, indeed, the lack of analogous training in the teachers' education, but still does not have an overview of the problem's faced in detail. Closer exchange of his intentions with the teachers' and students' actual experience would be fruitful in dealing with the extant situation.

Hence, the exploration of the phenomenon from the way it is intended by the Department, to its embodiment within the school praxis, revealed both the various contextual factors employed, and the significance of clear communication patterns between the parties involved.

What now remains, is the examination of the information provided by the Pedagogical Leader. Her experience will add to the present picture, by elucidating the role of the next-to-the-Department institution, namely the link between the Ministry and the schools.

4.1.3.2. The Pedagogical Leader and the rest of the participants

As mentioned also under the description of the present research¹¹³, the Pedagogical Leader works at the Educational Office of the county the schools belong to, and is thus responsible for the application of the national educational goals, core curriculum included. The data obtained from her includes information about both critical thinking and learning strategies. In addition, as it can be seen from the table that follows, information about her role has been registered in a separate category; the latter consists in the description of her duties and assignments.

Table 4.15. Constituents for the Pedagogical Leader

Critical Thinking

PERCEPTION	APPLICATION	ROLE
◆ Examination of knowledge	◆ Students' participation in the	◆ Examination of the general

¹¹³ See section 'Design'

	learning process ◆ Project-work	function of the schools ◆ Use of a report with emphasis on student participation ◆ Advises the schools to apply the guidelines ◆ Only for AA
--	------------------------------------	---

Learning Strategies

TIME	CONTENT	VALUE
◆ During 1 st year ◆ Instruction adequate for the next years ◆ Does not require specific information from schools	General or specific character	◆ Help students participate actively in the learning process ◆ Form a basic working method

The *perception* of critical thinking according to the Pedagogical Leader addresses the knowledge acquired at school; this refers to both the textbooks and any other additional material obtained by the students. It includes elaboration of the information given, with the aim to discover its truthfulness and correctness.

"[...] In the evaluation of the source material, in the evaluation of the information they receive, it is there where critical thinking enters the picture.[...]" (12).

This elaboration is carried out mainly by comparing the different perspectives, by examining all the pieces of information in relation to each other, so as to reveal similarities and differences, and thus be able to assess it.

"[...] and they [the students] will compare the various information they have got from various sides [...]" (12).

Accordingly, the *application* of critical thinking can take place in two cases.

Firstly, under the active participation of the students in the learning process. The Pedagogical Leader suggests that the employment of critical thinking occurs almost together with the adoption of those learning techniques that promote student initiation and action. When the students are in charge of acquiring the knowledge themselves, they are enabled to demonstrate critical thinking, as –according to the perception above- then they have the opportunity to elaborate the information obtained.

"[...] if the teachers use the working methods that naturally belong to the Reform, meaning the student active working methods, where the students are themselves active also in the acquirement of knowledge, then I believe that this at least contributes to the demonstration of a critical sense.[...]" (9).

Secondly, project-work is another occasion where critical thinking can be applied. This implies that the students find on their own access to the information needed, discover the

appropriate method to collect it, and eventually elaborate the facts retrieved in the aforementioned way.

"[...] project-work, I believe is an example of this type student activity, where the students [...] are in charge of finding out where they will acquire information, collect it, process it [...] this process that lies in a project-work I believe must be well-suited to this type, train this type of abilities." (11).

It is thus indicated that critical thinking elicits responsibility for the main actions taken under the acquisition of knowledge and its evaluation. It involves taking decisions regarding the steps to be taken in the quest for information, as well as making own judgements regarding its status.

Besides, the contribution of co-operation is also implied, as project-work involves close communication and exchange with others. Critical thinking, hence, involves the *other*, either as a discussion partner, or as an additional source of information.

Parallely, the actual discussions and actions taking place under the execution of project-work can be indicative of critical thinking demonstration. The teacher by paying attention to the way the process develops, the means and methods used, can check whether critical thinking is actually applied by the students.

"Otherwise it is of course that the teacher is willing to also follow up the groups under the course of the project-work, and be present and hear how they work, how they discuss.[...]" (15).

Moreover, the teachers have the opportunity to control whether such a procedure has taken place by asking from the students to present the actions taken; a project-work includes also demonstration of the results achieved in front of the classroom. Specifically, it is up to the teacher to require an assessment of the information the students have provided, which includes the elaboration of the various sources used. If the students are not able to show why and how they decided to use the specific information pieces, then it is suggested that critical thinking has not taken place.

"[...] Yes, they [the teachers] can check it [...] in the presentation of a project-work, they can decide that the students should take up an evaluation of the information they have obtained, of the sources they have used, and then present it. This can, must be a fruitful way to check it out." (14).

A further comment is necessary at that point. As seen above, the Pedagogical Leader indicates that the demonstration of critical thinking is more or less a natural consequence of an active student participation in the learning process; it will take place as the students are themselves responsible to carry out the tasks required, in this case the acquisition and

selection of the available information. Later on, however, it is suggested that it is up to the teacher to ask for such a procedure to take place, to initiate an elaboration of the information used. This means, in other words, that if the teacher does not urge the students to examine the information acquired, they might not do so. Elaboration, thus, is not as an automatic procedure as suggested above. The teacher seems to play a significant role, as s/he is the one who launches the engagement into critical thinking.

Returning to the application of critical thinking, the Pedagogical Leader indicates it can implicate various school subjects, as the common case is that of an interdisciplinary project-work. In other words, the students are expected to use knowledge pertaining to more than one subjects at the same time, and thus employ critical thinking in more than one subject-areas.

"[...] a project-work is usually or shall we rather say should be interdisciplinary, so that in the AA, it should possibly involve perhaps both Norwegian, and mathematics, and societal subjects, and English, and then we do not split the subjects, when for example you think about what the benefit is, then you consider all the interdisciplinary composition. It will be difficult to separate the subjects, on exactly that area." (17).

It is thus supported that project-work is a working mode addressing all the AA subjects, via their combination.

At this point, the *role* of the Pedagogical Leader needs to be examined, in order to clarify the above.

An initial point is that the Pedagogical Leader states she has experience only with the theoretically orientated subjects, AA. This means that she is not able to provide any information about the application of critical thinking under other types of training, be it FO, DD or mechanical subjects. When she receives a corresponding question, she acknowledges not possessing such knowledge.

"[...] It is perhaps a bit difficult for me to say, because I have never worked in a professionally oriented studying direction, I have general theoretical (AA) background. So exactly this, when the angle is the critical sense, then I am a bit unsure about...I am unsure about it. (13). [...] If we keep to the theme project-work, or the working mode project-work, [...] I have not experience neither with drama nor with FO. So I do not have such a good knowledge to the working method so as to compare it with any kind of AA subject..." (16).

Accordingly, the above description of the application of critical thinking should be seen only within the AA training frame.

Moreover, the Pedagogical Leader clarifies that she is not actually directly responsible to ensure that critical thinking is applied at schools. This is rather the duty of the schools themselves, as her role addresses a different area of obligation.

"[...] this is the primary assignment for the schools. And our assignment becomes of a higher level." (1).

Specifically, the schools are expected to inform the Office (in written) of the various school activities, at rather long time intervals. The areas on which they are to report are determined by the Pedagogical Leader, among others, and address guidelines and goals included in the state documents pertaining to Reform -94.

"[...] through the yearly report the schools give us [...] (2) [...] We have made a form, and posed some questions, [...] we have put weight on some elements of the content of the Reform. Or this which is especially focused upon, and it concerns such [matters] as differentiation, student evaluation, school evaluation, student participation in the training –in the planning, execution and evaluation of the training- they are the central things [...]" (4).

The schools elaborate the way they work toward the above areas identified in the report, they present the actions taken and methods used so as to actualise the guidelines given. The Pedagogical Leader specifies this report contains principally almost the same areas each time; it is an aim that it should have an invariable content.

"[...] questions which are in their majority the same, or we try to keep this form as constant as possible, year after year [...]" (4).

Hence, the schools are well aware of the topics they are to report on. They are given the opportunity to prepare adequately for the presentation of analogous schoolwork, both in this written report, and under the school visits the Pedagogical Leader makes.

"And in the spring we have said or written to the schools before we went on a school visit that it is those things we will ask about, that we ask to talk about when we come out to the schools. First of all those things here." (22).

Thus, the role of the Pedagogical Leader is to conduct rather infrequent visits at schools with the aim to control that what is presented in the report is being applied in praxis. Her duty is to ensure the schools follow the guidelines set.

"[...] and through the yearly school visits which we make to follow up this report, then it is more a general follow-up of that the schools do their job, execute their mission. (2) [...] When we visit the schools then we ask, or we go especially deep in those themes which I mentioned [...] (6) [...] Once a year. It is in spring." (22).

It is also indicated that not all the schools fulfil this obligation, as not all demonstrate the application of the guidelines given. In such cases, the role of the Pedagogical Leader is to remind them of their duty by pointing out the areas they have to put on more effort. In the opposite case of a school which has successfully done so, the Pedagogical Leader provides a positive reaction.

"[...] those themes [...] which the schools already have written something about, or perhaps they have not written something about, but should have done so. (6) [...] And in any case we go into that, under the school visit, to be a kind of enforcer, to make sure that the schools do not forget it. And then we will either give praise for, or we will challenge the schools, if we think they have not done enough on those areas." (7).

She functions, in other words, as a type of feedback for the schools' actions and work, as someone who motivates them to continue their efforts.

However, the Pedagogical Leader acknowledges that critical thinking is not represented in that report. The topics included address the core curriculum in a general way, do not examine any specific area in detail. The schools are supposed to show that they work in accordance with the general spirit of the core curriculum.

"So that we have no concrete activity that regards exactly that, we do not ask especially about that, but underline the schools' duty to follow up the core curriculum, in general. But this is not a special object of our quality securing, to put it that way." (3).

Hence, the corroboration that critical thinking is applied in praxis, occurs indirectly, through assumptions made out of the information the schools provide on other activities. The Pedagogical Leader supports, in particular, that when the schools make use of the working methods suggested by the Reform -94, critical thinking is also demonstrated.

"[...] so I think that perhaps indirectly we will, we take up those themes you mention here, by focusing on the pedagogical working ways" (10).

Specifically, the schools are obliged to a minimum number of interdisciplinary project-works every year. Even though the Pedagogical Leader does not have a full overview of the exact type of work executed within each school, she guesses that the above is indeed the case, as it is included in the educational regulation. Albeit requisite, the total amount and type of project-work the students carry out, is actually up to the schools to decide.

"[...] The requirement is that all the students are going to carry out at least one interdisciplinary project-work each year. And then it is this with the interdisciplinary project that is most usual, that many classes, many schools carry out more than one project-work per year, but I have the impression that most of the project-works are

interdisciplinary, so that they at least include two subjects.[...] an interdisciplinary project is the rule. And it is the least requirement, but apart from that, it will vary, and the schools decide themselves." (18).

Furthermore, the Pedagogical Leader specifies that earlier, she used to acquire knowledge on the above directly from the written school reports. However, the last years the form given to the schools does not include project-work any longer, as experience has shown that the schools manage to carry out such assignments successfully. It is thus not considered essential to ask for detailed information on that area; the schools are presumably involved in project-work, as they have demonstrated earlier.

"[...] The reporting on project-work, we have had it in the report, but we have gradually excluded it, because it has been so well incorporated, there was a period it should be incorporated, that we think it was important to ask about it. So now it is not a steadfast point on the form anymore. And now the schools have had quite some hold on it, that we assume it takes place by itself." (19).

This non-direct contact with the information on the application of critical thinking, is further demonstrated by the Pedagogical Leader; she assumes that critical thinking is indeed an object of training at schools, as the guidelines of the core curriculum direct so.

"[...] It [the report] does not go especially in those themes you have picked up here, it will not. [...] We presume that it is part of the daily work the schools..." (8).

Moreover, the reason why critical thinking is not specifically included in the yearly school report, is purely practical. The core curriculum themes the report refers to must be restricted to a material volume that can be handled in an easy way. If a big number of aspects were to be included, the report would take unfortunate dimensions.

"[...] otherwise it would be too extensive, were we to take all the sides of the core curriculum" (5).

The Pedagogical Leader underlines that all the individual school reports are to be summarised in one, which will be delivered to the authorities. It is therefore why a certain selection of topics must take place.

"There is so much we could have asked about, in such a report. But then it will easily become very many pages, and we will combine all the reports to a common one, which will actually be sent to the politicians, and then it can soon become very thick, so we were forced to concentrate on some few themes." (20).

In other words, it is external factors that dictate the amount, and consequently the content of the school report. The Pedagogical Leader acknowledges the existence of other

areas than call for investigation, but feels forced by the circumstances to limit this investigation to a small selected area.

Parallely, she clarifies that the final topics to be included are chosen on the basis of the areas that are underlined in the Reform -94. Those refer to pedagogical methods and techniques, mostly addressing students and their activities.

"[...] We have chosen the central pedagogical focus areas within the Reform, which I mentioned earlier, this with differentiation, student evaluation, school evaluation, and student participation. A few more themes, but it is those which are the central ones." (21).

To sum up, the application of critical thinking is not directly examined by the Pedagogical Leader, as it is not included in the school report. External, practical factors dictate a selection of topics to take place, meaning a restriction to the central pedagogical working methods. They are also considered indicative of critical thinking. Thus, it is the schools that are primarily responsible to ensure critical thinking training and demonstration, something which the Pedagogical Leader considers natural to occur, as it is included in the educational directives.

In an analogous way, *learning strategies* are not a target of investigation. The Pedagogical Leader explains that the common case is that the schools take up such training in the beginning of the first year, during the foundation courses. The exact content of, or the extent to which such lessons take place, is however not known to her.

"At our Office, we do not check systematically the degree to which the schools execute introduction to studying techniques. We just register that, it is quite usual, that the schools during the first school week or the first school weeks have short courses in the introduction to studying techniques for the new students. (23) [...] So [...] we have not taken any systematic questioning about who makes what of the schools here, but it is our impression that very many schools do it, perhaps all, but the last will be a guess." (24).

Besides the non-specific control on the training of learning strategies, the Pedagogical Leader states the schools do not receive any particular suggestions toward that direction either. It is presumed that such courses take place; it is up to the individual school to include them in the students' education.

"But we from our office do not undertake any special [action] so that they shall do it, it is just...they can..." (27).

As hinted above, those courses are of a rather short duration, and are considered necessary for the students who attend the particular school level for the first time; such skills

are useful to their future school activity. Learning strategies compound, thus, a basic working mode.

"[...] I'm talking actually about the foundation courses, here we are talking about the new students, so it is for the most part at the foundation courses that we have this beginning period, which can last from one, two days to a week, where it is very usual to include introduction to studying techniques." (23).

The Pedagogical Leader indicates the content of those courses might either refer to a specific subject, or include training on techniques of a more general nature. In the question whether they are directly related to a specific subject or not, she answers:

"[...] It can be both." (26).

In addition, those studying technique courses do not take place systematically after the first year, because it is not considered urgent to do so. As hinted above, the introductory courses aim at forming a basis working mode which the students can use in order to manage the demands of the schoolwork. Once obtained, no further training is necessary.

"[...] because one reckons that then the foundation for the work's studying technique is set, and that they do not need it." (25).

The Pedagogical Leader adds that such techniques are also included in specially designed booklets which address methods that enable the students participate actively in the learning process. Those are both given to the students by the authorities, and written by the students themselves. Learning strategies, hence, are tools which contribute to active learning.

"And it is in that respect, part of the subject in a booklet, which is made with the intention to train students in student participation.[...] (24) [...] they are in the methodical guidance from the national level. Have you heard of the booklet 'Veiviseren'? [...] it is in there, also an own project made locally from our students, in the county [...]" (28).

To sum up, learning strategies are considered a basic working mode, necessary to fulfil the present school demands. Their instruction at schools is not systematically investigated by the Pedagogical Leader, but is rather assumed to be included in the schools' routine, mainly in the first year. Further training is not considered urgent, as information about those techniques is given in various guidance booklets, which the students have access to.

Commenting now the experience of the Pedagogical Leader as a whole, the following can be said:

- Initially, seen from an administrative point of view, her position implies responsibility for all school types, both theoretically and practically oriented. She, however, is

able of providing concrete information regarding only those subjects she has background in, meaning AA. This lack of direct personal experience with other studying directions limits her knowledge on specific training issues, as is also acknowledged by her in the present case of critical thinking. She declares not being in a position to provide any information regarding the application of critical thinking in other subjects.

The above pose a crucial question; how is she to provide specific advice on and help with issues that subjects other than AA face problems with? How is it possible to identify the concrete actions those schools should take for the application of critical thinking, when corresponding knowledge is missing? We saw, for example, that the experience of critical thinking application is *situated*; meaning that the characteristics of the subject determine the working ways and methods to be used. Those subject particularities ask for special attention, when critical thinking training is considered. The Pedagogical Leader, though, cannot provide any insight on that issue, as she is not able to identify the differences found between the school subjects, and thus come with concrete suggestions.

- Moreover, even when the description of the Pedagogical Leader is seen parallel only to the AA participants, a rather big distance is still observed. The perception of the Pedagogical Leader is quite limited compared to the others, who refer for example also to the evaluation of one's work, the decisions made under working process, an attitude of opposition and so on. A similar situation emerges when the application of critical thinking is examined. The Pedagogical Leader talks in general terms; she does not acknowledge for example certain problems which the principal of School 1 reports on (i.e. the problems AA faces). Moreover, no corresponding requirements or factors which influence the demonstration of critical thinking are indicated by the Pedagogical Leader.

Consequently, it is implied that the phenomenon has not been an object of thorough elaboration, an assertion actually verified by the Pedagogical Leader herself. She specifically acknowledges no direct engagement in critical thinking, as it is not included in the school reports.

Again, the main aporia at this point is whether this lack of a comprehensive overview on the phenomenon limits the help the schools can receive, when for example experiencing various hindrances under the application of critical thinking.

- This leads us to the next point, which is the predetermined areas the schools are obliged to report on. Considering the above differences, it is suggested that the restricted character of the form does not allow the significance of certain issues to emerge. The case of School 1 can be given as an example; the principal underlines that critical thinking area is a

rather central focus within the students' training, as specially designed programmes embrace it. The Pedagogical Leader, however, does not even include critical thinking as a topic in the school report. This reflects actually a difference in the priorities the Office and the school sets, which inevitably influences the school practice. The schools usually require a support system on the areas they consider as significant; when those areas are not fully known to the Educational Office, the effectiveness of the schools' efforts is naturally limited.

Besides, one cannot help to wonder how effective such a reporting is, as when the topics elaborated are more or less the same every time. The possibility of the establishment of analogous reporting routines cannot be excluded. Some schools might answer to the requirements of the annual report by repeating the previous year's activities; it is possible that they fail to recognise its deeper purpose, it being an indication, for example, of the school progress made year by year. Moreover, some might feel that the Office shows little interest in the actual function of the schools, as the stable form of the report looks like it has been more or less reproduced directly from the previous years' form, and sent over to the schools.

- Parallely, the school visits carried out by the Pedagogical Leader might also not be very fruitful for the schools' function.

Specifically, as the focus is again on those topics decided not by the schools themselves, but by the Office, other issues crucial for the schools might not be taken up. The Pedagogical Leader hints at this direction, when she suggests that it is the general function of the schools that is controlled, the fact whether they follow the core curriculum in its general sense. The embrace of such a focus, leads also to the attitude that everything else specific is purely a responsibility of the schools to ensure. Accordingly, the Pedagogical Leader underlines that critical thinking is a sub-topic, not included in the report, and thus not controlled directly. It is considered as an 'internal' affair for the schools. She concludes that if the external frame, namely the general spirit the school functions, is found to be in accordance with the given guidelines, then such specific issues like critical thinking are assumed to be more or less automatically applied.

However, it has been clearly shown from the school participants that this is most often not the case. The fact that the school provides with opportunities to demonstrate critical thinking, for example, is not always translated into actual application of it. There are particular factors that influence critical thinking, which have to be examined in addition to the general spirit the school operates under. Both Hernes and the school participants refer to factors which play a significant role in critical thinking demonstration, like the school subject, the type of work involved, the exam goals, the teacher's attitude.

This is even suggested by the Pedagogical Leader herself, when she refers to the significance of the teacher's role in the initiation of critical thinking. Her description conveys thus a contradiction, namely the belief in critical thinking being applied as a natural consequence, and the simultaneous necessity of the teacher for its initiation. This implies a non-thorough consideration of such specific issues the schools deal with, which again signifies the possibility that the schools conceive the support and advice provided as non-satisfactory.

- An additional doubt about the actual elucidation of critical thinking through the examination of broader teaching methods also arises when considering the topics included in the school report. The Pedagogical Leader mentions that project-work has been removed from the school reports, as experience has proven it successfully applied. However, she also identifies project-work as one of the main ways critical thinking can be applied at schools. How is it possible then to induce any information about critical thinking, when the pedagogical method critical thinking pertains to is not a topic of the school report? Reasonable grounds for such a question are indeed found in the Pedagogical Leader's experience.

The attitude that the examination of specific topics like critical thinking, is an 'internal' school affair, is also reinforced by the belief that whatever is presented as a guideline from the national documents, is actually followed. It is implied that the Pedagogical Leader has quite a faith into that the schools will act according to the core curriculum, that they will be obedient to the guidelines posed, indifferent of the various obstacles that might arise. The same is also indicated when she discusses learning strategies; namely that the students will be trained into them in any case, as information about them is included in the various methodological booklets.

However, there is no guarantee that either the teachers or the students are engaged in such an elaboration of those booklets. As seen from School 2, for example, the specific syllabus's goals are prioritised over the core curriculum. Some of the students have not even heard about critical thinking before, something which indicates they have not read thoroughly the core curriculum before. In addition, the Principal underlines that a big majority of the students suffer from learning difficulties, and are not always able to read and comprehend written texts. The school focuses on practice, which implies that such issues as the elaboration of the core curriculum parts, does not take place extensively. Something similar can be suggested for the teacher of AA, for example, who has difficulties in comprehending critical thinking in relation to her subject; it is implied that thorough elaboration of the core

curriculum in such a way has not taken place, perhaps not even at a broader school level. This, even though the general practice of School 1 is adjusted in accordance to the core curriculum guidelines.

Accordingly, the Pedagogical Leader's belief that it is not necessary to address directly such specific issues like critical thinking during her school visits, is not founded by the participants' data.

Hence, it is suggested that the type and amount of contact the Pedagogical Leader has with both teachers and students is not appropriate or adequate so as to reveal all the above facts and factors. An apparent case is this of learning strategies; their necessity is emphasised by the majority of the students, who feel left alone to deal with the school demands. The Pedagogical Leader, however, believes it is not essential to provide with more studying technique courses; she also acknowledges not urging the schools to do so. Thus, a vicious circle is formed: the school fails to recognise the significance training on learning strategies has for the students, an approach reinforced by the Pedagogical Leader; this situation elicits in turn unfortunate outcomes for the students, regarding training into critical thinking.

The importance of having a direct contact with the school reality can be also shown by reference to the initial hesitation the Pedagogical Leader shows when asked to provide with a specific example of critical thinking application. She states not having had contact with a classroom for quite some time, and thus having a weak memory for such issues.

"It is five and half years since I have been in the classroom myself, and I forget quickly in that respect [...]" (11).

The above gives grounds to challenge the assertion that the Pedagogical Leader has all the information and knowledge necessary to provide clear, concrete advice to the schools. She supports controlling the application of critical thinking indirectly, through the investigation of the working methods applied. However, if the concrete way to apply critical thinking is not so clearly established by her, how can she know which particular working modes to look for as indications of critical thinking?

Is her role perhaps limited to the provision of a feedback, positive or negative, as is also suggested by her? This, however, comes in clear opposition to what Hernes supports, that the Educational Offices are principally in charge of ensuring the application of the core curriculum. They should possess all the necessary information and knowledge to provide the support the schools require, always by taking into account the latter's individual needs.

Thus, what is supported by Hernes, that the educational sphere has not comprehended fully the gravity of the content of the core curriculum seems to be actual in that case. The

Pedagogical Leader, namely, does not prioritise critical thinking in that sense, something which signals that she does not perceive it as being so essential as intended.

Consequently, the final remarks address the issue of *communication*. Critical thinking as presented by Hernes in the core curriculum, is not being fully comprehended by the next level in the educational system, namely by the representative of the Educational Office. Her experience of the phenomenon does not convey the meanings Hernes intends. Moreover, her conception of her duties regarding school function and critical thinking is again not in full agreement with Hernes's indications. She, in turn, departing from her experience and convictions influences the adoption of a certain policy by the schools, which does not add to the promotion of critical thinking. The phenomenon is not prioritised and not directly addressed; as a result, those schools that do treat it as a focal area, like School 1, do not receive help where needed. Perception and application issues are not being further elaborated, the specific problems faced are not being dealt with, under this exchange with the Educational Office. Besides, those schools that do not consider critical thinking as a particular instructional focus, are not encouraged or suggested to do so, hence reinforcing the corresponding lack of training. The school's policy has in turn direct consequences on the students' education, as it sets the frame for their training. Critical thinking is either not promoted in a fully successful way in all the subjects, or not promoted at all.

The Pedagogical Leader, in other words, seems to be a broken link in the communicational chain between the Department –Hernes- and the schools. The gravity critical thinking should have and the ways it could be promoted at schools, according to Hernes's intentions, are not being transferred to the individual school participants, as the middle link, the Educational Office, does not contribute to that. Had the Pedagogical leader been aware of the various teaching ways to be used under training into critical thinking, less problems regarding its development and application would have been faced. The focal point in School 2, would have shifted from the students to the teachers, for example, had an analogous line been set by the Pedagogical Leader. The principal of School 1 would have been capable of providing specific examples to the teacher of AA, on how to apply critical thinking in her subject, had she been familiar with them, intrigued by the Pedagogical Leader.

On the other hand, better communicative patterns would have informed Hernes and the Department in a more sufficient way about the problems faced at schools on the present issue. The practical reasons provided by the Pedagogical Leader for the selection of a limited number of topics in the school report, and for keeping its form stable, do not seem to be known to Hernes, who demands full control of the critical thinking application to be carried

out by the Educational Offices. A thorough exchange of information would enable the identification of those factors which hinder critical thinking, and their eventual solution. The way the exam goals counteract training into critical thinking, for example would have been realised by the authorities, if they had been emphasised by the Pedagogical Leader. Similarly, if the particular problems faced in the various studying directions had been communicated to Hernes by the Pedagogical Leader, perhaps concrete actions to be taken would have been suggested.

The significance of an ample and proper communication is thus highlighted, especially considering the distance found between Hernes's clear conception of critical thinking and of its application, and the rather diverse situation encountered at schools. If the writer of the critical thinking paragraphs can explain the meaning of critical thinking and illustrate its application in quite some extent within the short limits of a research interview, then there must be a way that the schools can develop analogous methods to do the same thing. What is required is the establishment of clear communication routines, with emphasis on the actual urgent areas, by taking into account the individual needs and particularities, pertaining either to schools as a system, or to teachers and students. By taking into consideration this whole network of interactions, prolific grounds for the fulfilment of the specific goal of the core curriculum are put, meaning for the promotion and application of critical thinking at schools.

4.1.4. Summary of the section

The present section examined critical thinking by direct reference to the way it is intended. Namely, the experience of Hernes regarding critical thinking and its formulation in the core curriculum was investigated. The aim was to uncover whether the phenomenon changes while being applied into the educational realm. Hence, the way it is experienced by the Pedagogical Leader was also included. Corresponding analysis provided the delineation of the metamorphosis of critical thinking from theory to practice. In addition to the particular differences detected between the research participants, the factors pertaining to the general contextual frame critical thinking operates within were also identified. Namely, the significance of the content and type of the communication patterns established within the educational system was emphasised.

The next section examines the main findings on critical thinking obtained by the data in relation to the literature presented in the theoretical part of this paper.

4.2. DIALOGUE WITH THE LITERATURE

In the present part, the data are compared to the literature presented in Chapter 1. Firstly, the conception of critical thinking according to the two groups of approaches, the traditional and the challenging one, is discussed in relation to the research findings. Secondly, the literature on learning strategies is seen in relation to the data. Finally, findings regarding various aspects of critical thinking, as well as school culture, are seen parallel to the information provided by the student ombudsman.

4.2.1. Critical thinking literature and the participants' experiences

In order to facilitate the analysis, a table presenting schematically the theories and assertions pertaining to the two critical thinking approaches is given. Specifically, the information is organised into two main categories, namely the *nature* and *instruction* of critical thinking; each category is divided in further sub-topics. It should be also reminded that the traditional view is represented by R. Ennis, M. Lipman, J. McPeck, R. Paul, H. Siegel and D. F. Halpern; the challenging view includes B. J. Thayer-Bacon, and other individual researchers and theorists.

As mentioned before, the gestalt of meanings conveyed by the participants is divided into *perception* and *application* of critical thinking. Accordingly, the topics included in the *nature* table category pertain to the first, whereas those in the *instruction* category to the latter. The way to proceed with the comparison is to depart from the constituents found in the research data, and look for them into the extant theories.

Such a comparison highlights the value of the findings obtained and reveals the originality of the data. Similarities and differences are detected, and new elements are remarked.

Table 4.16 Critical thinking – traditional view and its challenges

TRADITIONAL VIEW							CHALLENGING VIEW		
NATURE	ENNIS	LIPMAN	MCPECK	PAUL	SIEGEL	HALPERN	THAYER-BACON	OTHER APPROACHES	
Definition/Description ¹¹⁴	Reasonable reflective thinking	Skilful, responsible thinking	Skill & propensity for reflective scepticism.	Two types: weak & strong	Reasons to justify beliefs and actions	Skills & strategies to fulfil individual needs & wishes	Meaning, new knowledge connections, alternatives, actions	Question own beliefs and assumptions, comprehension of context, action	
Components/Characteristics	Reasoning, objective, universal	Reasoning, standards. Context-laden	Rational thinking about sth specific	Disciplined, self-directed	Reason assessment & critical spirit		Context- and cultural-laden. Constructed, a tool. Not objective	Context- & culture-bound	
Skills/abilities	Cognitive (12)		Evaluate reasons, reflect, question, judge	Skills extrinsic/intrinsic to the person	Evaluate reasons	Cognitive, but context-laden	Relational & communicational		
Dispositions	(14) Reason-seeking, search for alternatives, open-mindedness, sensitivity to others		To carry out evaluation	Central. Serve one's benefit or others'	Self-confidence, emotional security	Willingness, planned action, flexibility, awareness	Openness to emotions		
Generability	Yes: from school to everyday life		No	Yes	Yes				
Function	Evaluation resolution, comprehension	Facilitates good judgement	Solution to a problem (theory)	Personal insight. Shaping values, meaning	Rational justification	Desirable outcome according to personally defined goals	Self-awareness	Self-understanding within context. Alter self-view. Understanding of power & knowledge creation	
Requirements	Background knowledge		Field knowledge		Subject-specific & general logical principles. Psychological health	Mental effort	Care for the other. Imagination, emotion, intuition, reason, creativity	Context specific knowledge & experience	
Emotions							Yes, tools	Evoked & involved	
Arts							Yes, tools		
The Other		Dialogue		Perspective, empathy			Perspective		
Body							Bodymind. Material that addresses all the senses	Thought & action together	

¹¹⁴ The term 'description' is used since not all the challenging approach theorists support the need for a critical thinking definition (e.g. Kincheloe, 2000).

INSTRUCTION												
What	Logic	Philosophy	The structure of disciplines	Awareness of perspectives			Thinking & metacognitive skills, specific techniques	Power relations, perspectives, awareness of feelings	Self-awareness, perspectives, analysis of stereotypes & morale, student-centred learning, source evaluation			
Where	Mixed approach		Subject-specific				Content-laden, designed to promote transfer					
Teacher's role			Analytical thinking, openness						Motivate, model, time for reflection, feedback, challenge, protect, support			
Milieu									School vision, equality. Safe for emotions and risk-taking			
Subject's nature			Some not amenable						Material volume			
Obstacles			Educational requirements						Educational system, societal values, teacher training, class size, evaluation issues, schedule, guidelines, conceptions of knowledge			

Starting with the *perception* of critical thinking, the participants' descriptions address in general two main areas; theory and praxis, depending on the type of training involved. Moreover, in some cases references to a certain kind of attitude is included.

Accordingly, the experiences with critical thinking concern;

a) *theory*: examination of information/knowledge, evaluation of work/instruction, autonomous reasoning, decisions regarding the learning process.

b) *praxis*: examination of the working process/environment, judgements/decisions regarding the working process, discovery of a solution, adoption of routine working ways.

c) *attitude*: opposition, scepticism and care.

Each area is examined separately.

As seen from the table, the traditional approach refers principally to the above '*theory*' area.

Specifically, Ennis, Lipman and McPeck emphasise the employment of reasoning and rational thinking processes in order to examine ideas, positions, assertions, and provide well-justified conclusions. Paul, Siegel and Halpern define critical thinking as the process of assessing reasons provided for the validity of statements, in order to discover strong arguments that support one's views. Some examples of their definitions include:

"[...] reasonable reflective thinking that is focused on deciding what to believe or do" (Ennis, 1992, p. 22).

"[...] skillful, responsible thinking that facilitates good judgment [...]" (Lipman; see Johnson., 1992, p. 40)

"[...] the focus on reasons and the power of reasons to warrant or justify beliefs, claims and actions." (Siegel; see Thayer-Bacon, 2000, p. 65)

The above resembles the participants' references to the analysis of the knowledge and information acquired at school. Ennis's evaluation of the others' arguments is germane to the investigation of whether the knowledge is truthful and correct, supported by Principal 1, for example. The evaluation of the source the knowledge facts came from, that the Pedagogical Leader mentions, sounds like McPeck's evaluation, which is based on information facts. The traditional theorists seem also to be close to the AA teacher, who indicates that critical thinking includes reasoning. Ennis and Siegel, for instance, underline a sensible way of thinking that leads to rational justifications.

In addition, the participants' conceptions concerning critical thinking in practical subjects can be partially detected in the traditional view; this regards in particular the evaluation of the

actions taken and of the work produced. When the teacher of FO, for example, describes the various types of work assessment taking place, Ennis's evaluation comes in mind. The analysis of the working process and steps taken indicated by the male FO student, pertain to Halpern's use of skills and strategies under the achievement of a certain aim. The evaluation of the work produced that the drama students refer to, can be connected to Lipman's use of criteria so as to arrive at personal judgements.

Parallely, the traditional sphere is characterised by a common reference to the use of criteria and standards in order to carry out either a statement analysis or an evaluation. Its advocates refer clearly to the fact that critical thinking is a 'correct' way of flawless thinking, governed usually by laws of logic and rationality. Even though there are different degrees of how rigid this type of thinking is, all the representatives refer to those characteristics.

Accordingly, Ennis, McPeck and Siegel can be said to be the most rigorous –in the above sense- theorists. For them, critical thinking is either synonymous to reasoning, or it encompasses rationality, and provides with justifications that answer to logic. Ennis (1992) for example, urges for the evaluation of statements in the 'right' way, Siegel (see Thayer-Bacon, 2000) claims critical thinking is consistent, requires principals, is almost equal to absolutism. Paul (see Sarris, 2000), similarly, supports that critical thinking is devoid of historical and social influences and McPeck supports that;

"[...] critical thinking involves methods for arriving at correct assessments." (see Bailin, 1992, p. 95).

The above emphasise the use of universal, objective standards, which pertain to logical principles. The research data, though, do not support this absolutism in the type of standards used. The participants' experiences are situated, meaning that the evaluation and analysis criteria depend on the context. Hernes, for instance, refers clearly to the consideration of the tradition each object belongs to, and to the fact that the criteria are always seen in close relation to the individual characteristics of the object examined. The only exception could be said to be the teacher of AA, with her supporting autonomous reasoning and logic justification of judgements. Still, her reference to the arguments taken from the media, signifies a relativity of the criteria used, according for example to the extant socio-political circumstances,.

Hence, Lipman and Halpern's theories approach more the meanings conveyed by the data, as they initially acknowledge that the standards employed are context-laden. Lipman (see

Thayer-Bacon, 2000) supports that the self is relational, meaning that it co-exists with others and co-creates meaning. However, he also argues that philosophy provides the criteria for good reasoning; this is perhaps why he uses the phrase 'criteria *sensitive* to context', and not 'context-bound'. Halpern (1998) underlines the importance of being aware of the social and behavioural norms involved under critical thinking. At the same time, though, she is concerned with what is not a 'valid' argument; she does not for example recognise the value of the subjective experience.

The presence of context, thus, for the traditional view implies the context-laden skills and abilities used under critical thinking. The type of evaluation to be carried out, in other words, determines the *type* of skills to be employed, like for example verbal reasoning, hypothesis testing or decision-making (Halpern, 1998).

In contrast, the use of context under the description of the standards and criteria employed by the participants is done in a different way. The DD teacher is perhaps the most representative example; she illustrates that the kind of work involved in drama asks for assessment based on the very features of the work itself, like on voice, movements, let alone emotions and feelings. Both objective and subjective standards pertain to the individual qualities of a theatrical performance, which can hardly be used in any other type of work. The same regards FO and the assessment of colour and material use, or the students of School 2 and the consideration of the way the car engine sounds.

Hence, the fact that the criteria used depend on the nature of the object or situation under examination cannot be detected in the traditional approach. The latter views critical thinking as an objective and rational mental activity, a view which does not permit such flexibility in the kind of criteria and rules applied.

To sum up so far, the proponents of the traditional view refer to the *intellectual* part of critical thinking, meaning the first area the participants' experiences address. In that case, the person examines the validity of statements and provides support for the judgements made. The traditional advocates indeed refer also to praxis –the second area the participants include- but this reference is only tangential. Praxis is namely always mentioned within the mental frame. Ennis's definition above illustrates that in a clear way; Siegel and Halpern indicate that critical thinking can be used to justify not only thoughts made, but action taken as well. Hence, praxis according to those scholars is not an incorporated part of critical thinking. It is rather something which is

justified by critical thinking, not *involved* in it. Critical thinking according to them is a sheer cerebral activity.

In other words, what cannot be detected in the literature pertaining to this approach is what the participants who especially attend subjects of a practical character experience as critical thinking; meaning the participation of the acts taken under the execution of practical work, the evaluation of working situations and the establishment of working ways by direct use of praxis. The factors involved in such cases are not to be found in the traditional approach, which limits critical thinking to the use of mental competencies and skills in a mechanistic act of justifying thoughts and actions. There is an exclusive emphasis on the cognitive side of critical thinking, which is not in full agreement with the data. Furthermore, the criteria and standards used under critical thinking are not context-dependent in the same way they are described by the participants.

Both the above elements can be found in the challenging approach.

The inclusion of '*praxis*' in the very process of critical thinking is indicated by the challenging scholars. Initially, the representatives of this view do not support the split between the mind and the body; critical thinkers make an integrative use of both. Thayer-Bacon (2000) underlines that we should not neglect the role of the body, the fact that the body *knows*.

In other words, the brain is not considered the main centre of critical thinking. The physical senses also participate actively; the use of school material that pertains to them is encouraged, as people experience also with their bodies.

Accordingly, there is a particular reference to the use of artistic means under critical thinking, as arts contribute in a unique way.

"Traditional critical thinking models do not tend to view artistic types of activities as useful or necessary in helping students develop their logical, reasoning skills. That these activities are exploratory, self-discovery activities, without teacher direction or input, places them in a creative category but not in a critical thinking category." (Thayer-Bacon, 2000, p. 129).

Artistic expression is a useful tool; it intrigues imagination and creativity, necessary for example to the discovery of alternatives under critical thinking. Adams and Hamm (1994) claim that arts contribute to the ability to draw inferences and interpret notions, as they utilise systems of symbols and are open to various meanings. They contribute to the creation of original ideas, the unconventional.

"What a powerful tool arts education is for countering the tendency towards standardization! The notion that the arts can encourage wonder, inquiry, speculation, and technological literacy has for too long been lost in a morass of indifference, nostalgia, crafts, didacticism, and an already overcrowded curriculum." (p. 264).

Moreover, Brookfield (1991) maintains that the type of activity undertaken determines how critical thinking is demonstrated; various manifestations could be writing, talking, actions, depending on both the individual and the context. This is something that the data also indicate; such nuances can be seen when examining the different ways critical thinking is employed under DD and AA for example, or at School 2, where physical senses are directly involved.

Thus, the challenging approach acknowledges the role of the body in critical thinking, in a way that the traditional approach does not. Nevertheless, the full extent to which the senses contribute to the demonstration of critical thinking is not clearly expressed by this approach either. The participants of School 2, for instance, elaborate the particular role the feedback from the physical senses plays in the evaluation process and in the discovery of the problem's solution. The body is not just experienced as a useful tool; its deeper function in the actual process of critical thinking is illustrated.

Returning now to the role of context on the type of standards used, the challenging approach offers a similar to the participants' view.

Brookfield (1991) argues for the importance of acknowledging such factors under an evaluation. He urges for the examination of the context the various assumptions pertain to, so as to become aware of its influence. Hernes's example about the students' exploring the reasons for the women going only in skirts in the past, is in clear agreement with the above.

Similarly, Bailin et al. (1999) state;

"[...] thinking about what to believe or do must meet appropriate *standards* if it is to be regarded as critical thinking [...] these standards cannot be met merely by accident or happenstance [...] (p. 287) [...] critical thinking always takes place in the context of [...] already existing concepts, beliefs, values, and ways of acting. This context plays a very significant role in determining what will count as sensible or reasonable application of standards and principles of good thinking. (p. 290) [...] Standards and principles of critical thinking are cultural artefacts that may be, and sometimes are, criticized and altered on the basis of our collective experience in using them [...] they are part of *evolving* traditions of inquiry and criticism." (p. 292; emphasis in original).

At the same time, Kraft (2000) illustrates the importance of the context by reference to the multitude perspectives involved in critical thinking. The same issue can be examined under the light of different views, also by overcoming the given context. An analysis can reveal how the particular characteristics of each context can alter the evaluation and judgements made. In the opposite case of a mere rational analysis –as the traditional approach supports- critical thinking is not actually applied.

"Another perspective that is popularly touted in schools has students engage in a process of logical reasoning that may or may not alter students' perceptions or beliefs about social reality. Critical thinking of this nature typically asks students to conceptualize, apply, analyze, synthesize, and/or evaluate information gathered from, or generated by observation, experience reasoning, or communication. This practice of critical thinking is nothing more than cognitive activity that asks students to engage in logical reasoning or to scrutinize arguments for assertions unsupported by empirical evidence. This mode of critical thinking does not necessarily challenge the student to analyze the information from a variety of perspectives -from the perspective of the assumptions underlying one's beliefs and behaviors- and much less from the perspective of race, class, or gender and power relationships in society." (p. 79).

Critical thinking, then, becomes the construction of meaning, the comprehension of relations between the various knowledge facts, in other words the apprehension of the context's influence on people (Adams and Hamm, 1994). Hernes comes again in mind, with his reference to the examination of the societal factors shaping one's views, beliefs, and current state of being.

"*Critical thinking* occurs when students *construct meaning* by interpreting, analyzing, and manipulating information in response to a problem or question that requires more than a direct, one-right-answer application of previously learned knowledge." (Adams and Hamm, 1994, p. 16; emphasis in original).

Likewise, as the teachers of School 2 emphasise, comprehension is what critical thinking addresses. They specifically refer to the understanding of theory through praxis; in other words, to the creation of meaning the theoretical text conveys, in a way that makes sense for the students operating within the particular context.

"The critical thinking process is one in which the student connects a variety of points of knowledge about a subject and ends up mentally transforming those separate points into a form that has special coherence for him or her." (Adams and Hamm, 1994, p. 19).

Subsequently, critical thinking for the challenging theorists is not limited to evaluation and analysis. The examination of the issue from various angles and the explication of the contextual influences, usually elicits the introduction of a new situation. The type of creative contradiction that Hernes refers to, is directly implicated here; it is also indicated in Bailin's (1992) words:

"It is important, then, that students recognize that critical thinking involves a joint and integrated process of generation and evaluation, the generation constrained by critical standards and the evaluation involving a generative dimension." (p. 95).

To sum up, the challenging approach is closer to the data findings. Their conception of critical thinking conveys not only a cerebral activity -as supported in the traditional view- but includes also the body. Moreover, critical thinking is not considered to be infallible, pertaining to universal objective values, but is rather under the influence of the context. As such, it becomes a tool which enables the construction of meaning.

So far the two main areas the data revealed concerning the perception of critical thinking have been explored; the *theory* and the *praxis*. As seen above, the traditional approach pertains chiefly to the first, whereas the challenging approach includes both. Still, the unique way in which those two areas are amalgamated by the participants, is not conveyed comprehensively by the current literature.

The third area is now examined, namely the presence of a certain *attitude*; indeed, both approaches implicate it.

With regard to the traditional view, most of its proponents declare clearly the need of possessing certain dispositions in order to demonstrate critical thinking. Ennis (Kennedy et al., 1991), for instance, lists fourteen dispositions, among which reason-seeking, open-mindedness, search for alternatives; McPeck (1990a) claims that a willingness to engage in and carry out the evaluation is requisite; Siegel (see Thayer-Bacon, 2000) refers to the importance of self-confidence and emotional security in order to investigate one's beliefs, and Halpern (1998) supports the person should be willing to engage in such a process and adjust the strategies used, be flexible and aware of the extant norms.

The participants' descriptions do not include all the above; there is rather a main focus on the students' being sceptical to what they hear and willing to engage in the elaboration process. Such examples are, opposition to the established norms and curiosity for one's surroundings,

supported by Principal 1; an active attitude, mentioned by Principal 2, together with the will to engage in the learning process; an attitude of scepticism to the knowledge received, brought up by the first teacher from School 2.

The challenging approach avoids in general to talk about required dispositions in the above sense, as they believe that this signifies a separation between the knower and the object of knowledge (Thayer-Bacon, 2000). They however refer indirectly to the above, when discussing the importance of discovering the relation between power and knowledge; by realising that knowledge is constructed, and thus operating under the socio-historical contextual influences, the students can develop an inquisitive attitude to the authorities, facts, claims of experts. This can be seen in for example Kincheloe (2000), who initiates from the critical pedagogy/critical theory; the latter examines the interests served by the extant conceptions. The relationship between power, authority and knowledge is being investigated.

In addition, the challenging adherents introduce a new type of attitude, being open and receptive to emotions; the latter are namely active participants in critical thinking. This type of attitude, is found also in Principal 1, when she explains that caring for the others is significant for the initiation of critical thinking. Thayer-Bacon (2000) supports exactly the same; care makes people sensitive to the other's point of view.

Connected to the above is the role of emotions in critical thinking; they are not considered distracting to the thinking process, as is the case with the traditional view, but participating in a particular way. Sometimes emotions initiate critical thinking, like in the case of care, other times they are evoked by it, like in the case of joy, exhilaration, or even confusion.

"The uniqueness and complexity of individuals are viewed as problems to be overcome by science, not as irreducible aspects of nature; personal feelings and relationships are taken to be impediments to objectivity, not ingredients of discovery." (Martin, 1992, p. 168).

Likewise, Brookfield (1991) purports that critical thinking is both emotive and rational; it is a cognitive process, where the emotions are central. Anxiety, for example, might be evoked while questioning values and beliefs. This is also indicated by the male AA student; the direct confrontation of the teacher on an instruction issue in front of the whole class, might elicit a negative atmosphere.

Kincheloe (2000) acknowledges the role of the emotions by illustrating that the people cannot be separated from their bodily and emotional side.

"The technicist efforts to cultivate higher order critical thinking among teachers too often involved removing prospective practitioners from their lived worlds in order to control the variables of the situation. As a result, thinking is sequestered in artificial laboratory settings where passion and authentic feelings of love, hate, fear, and commitment are scientifically removed. Cartesian-Newtonian models of the rational process of critical thinking are always neutral, always removed from the body and its passions. These modernist models assume that a practitioner can be removed from his or her embeddedness in a physical context without affecting cognition." (pp. 24-5).

The DD teacher comprises a characteristic example here; a theatrical performance cannot be evaluated otherwise, but with the use of the emotions evoked. They are an inseparable part of drama work, their role and participation in the production and evaluation of one's work is highly underlined.

To sum up, both traditions maintain that a certain attitude is requisite to critical thinking. This is in agreement with the participants, who do not however make references to all the dispositions included by the traditional approach. More weight is given to a general attitude of willingness to engage in such a process, and to an inquisitive self. The challenging approach is closer to the data, also because it makes particular reference to the role of emotions in critical thinking, which has also been acknowledged by the participants.

After having examined the above three main areas, other issues concerning critical thinking are presented.

The aforementioned requirement of an attitude is usually connected to a discussion on the skills and abilities necessary for the demonstration of critical thinking.

The traditional view is quite explicit on the issue. A list of required skills is sometimes given, like in the case of Ennis (see Kennedy et al., 1991), who provides twelve cognitive skills to be possessed. Among them, we find the identification of the evaluation criteria. This could be rather similar to the procedure Hernes describes; the discovery of the appropriate criteria to the evaluation of an object. However, a crucial difference is that whereas Ennis provides the above as a required *skill* for the demonstration of critical thinking, Hernes *includes* it in the very process of critical thinking. Moreover, Ennis talked about the ability to identify the reasons provided for a specific conclusion. This resembles a lot what the teacher of AA considers as the ability to debate, to provide for and against arguments.

At the same time, the traditional advocates are concerned with whether those skills are of a specific or general nature. McPeck (1990a) supports a critical thinker should possess domain-

specific skills; should know how to evaluate reasons, reflect, question, and judge statements, but always within the specific knowledge field. Paul (1990), however, supports the opposite – domain-general skills. Siegel (see Thayer-Bacon, 2000) emphasises both; the ability to evaluate reasons in relation to general and specific logical canons. Halpern (1998), finally, describes a range of cognitive skills and abilities to be employed, according to the characteristics and demands of the specific context. She refers for example to argument analysis, hypothesis testing, decision-making, problem-solving, verbal reasoning.

However, the participants do not refer explicitly to the above skills. They rather experience critical thinking as *involving*, not being *dependent* on them. The evaluation of statements, for example, is what critical thinking includes, for the students of AA; it is not considered as a separate skill. Decision-making is included in the execution of project-work, as Principal 1 describes, it is not a skill to be possessed from before. Likewise, problem-solving is what the students of School 2 are engaged in when evaluating the indicative factors and try to find a solution; once again, there is no reference to a separate skill. Moreover, Halpern's verbal reasoning, for instance, is in some cases totally irrelevant, as Principal 2 specifically declares; the students do not need to verbally explain their actions, but rather perform them. Some of the students are even mute. The most obvious exception is the AA teacher, who agrees with for example Halpern's necessity for the 'argument analysis' skill and Siegel's 'evaluation of reasons' skill.

Besides, the male AA student refers to the effort that has to be paid in order to employ critical thinking. This element is found in Halpern (1998), who talks about the mental effort people have to exercise in order to think 'correctly', as everyday thinking is most often flawed. The AA student, though, does not mean exactly the same; he refers to personal effort to *understand* the subject, and eventually develop an interest for it, to use one's energy in order to find out what the subject includes.

The above divergence between the traditional approach and the data can be perhaps further elucidated by Barrow's (1999) description of the errors in thinking that contribute to what he calls 'the higher nonsense'. He refers to seven such errors, among which 'skill' is included. He purports that there is not a clear use of the term, as it is often mixed with the term 'ability'. According to him, skills are those abilities that can be discerned, trained, and are physical. Abilities can be of other types as well, for example 'getting on with people'. There is however a

tendency to call all abilities skills, and thus assume they are physical and trainable; he calls that crude behaviourism. In education, this is translated into a curriculum of performance, where only skill matters are pursued.

"Of course, critical thinking courses and courses in introductory philosophy or logic are not pointless. Logical reasoning has application in many number of contexts [...] But the fact remains that it is both empirically evident and logically certain that people cannot develop a skill of critical thinking, which, like a skill of wiggling their ears, they can display whatever the occasion or the party. Nor is this a matter, as has too often been said, of one merely needing to add information before one can display one's critical thinking in a given context [...] the abstract rules of logic, though they apply in various contexts, take a different substantive form in those different contexts." (p. 134).

Accordingly, the third error identified by Barrow is 'the generic fallacy', the belief that humans are constituted by skills, that are also generic; meaning that once possessed, they can be exercised in any case, irrelevant of the context. A big part of critical thinking theories belongs here, mainly those pertaining to the traditional field. Critical thinking is being attributed to the application of trainable skills, which become a considerable part of one's education.

Hence, it seems that Barrow's remarks describe more faithfully what the data revealed; that no particular independent general skills or abilities are recognised for the demonstration of critical thinking. This could certainly be due to the fact that the critical thinking experiences are context-dependent for the participants. The presence of isolated cognitive skills does not apply to all the types of training; thus, the participants do not acknowledge and state them as such. Besides, as Hernes clearly stated, the only thing required from the students in order to demonstrate critical thinking, is to become interested in the subject under scrutiny. No particular skills were identified.

What is supported by the challenging theorists is closer to the data findings. They rather talk about *tools* necessary for critical thinking demonstration, or social skills, not cognitive ones.

Thayer-Bacon (2000) for example, considers emotions, imagination and creativity essential means for the employment of critical thinking. An analogous emphasis on imagination is given by Hernes, under the discovery of alternatives. Besides, the challenging approach claims the person should be allowed to communicate with others. Critical thinking is considered a constructed tool, formed under co-operation and co-existence. Indeed, the data establish the role of the other. In most of the experiences, critical thinking is not considered a sole activity; it requires the other as a communicative partner.

The skills critical thinking requires are socially created and develop constantly. Context and culture play a significant role, as a universality of cognitive skills and abilities, for example, is not recognised. As Kuhn (1999) supports;

"On one side of the debate, traditionalists see it [critical thinking] as a set of mental competencies that reside inside individual heads. On the other, advocates of a newer, situated-cognition perspective regard intellectual skills as social practices exercised and shared within a community." (p. 24).

The difference detected between the two approaches on the skills and tools promoted, can be elucidated by reference to the initial diversion regarding the perception of critical thinking; it being a purely mental activity according to the traditional view, and an integrated body-mind activity according to the challenging view. Kincheloe (2000) for example, explains that critical thinking is not only a cognitive activity, but both psychological and social. He actually differentiates between 'uncritical critical thinking' -a set of skills, without examination of the consequences of thinking and the context it takes place in- and critical thinking -which is more than purely cognitive skills. Understanding the how of the knowledge production, as well as linguistic analysis and historical examination is necessary.

The data hints at the above direction, that critical thinking is not a mental activity where certain cognitive skills are employed; it includes bodily and emotional elements, which require the use of tools, under social exchange.

Indeed, instead of cognitive skills, the participants rather refer to the necessity of possessing corresponding knowledge. This could refer to purely theoretical knowledge regarding the subject-field; at FO this regards working rules and material, at School 2, theory of mechanics. It could also indicate knowledge of the tradition the object under scrutiny belongs to, like Hernes specifies, or knowledge of the criteria used to evaluate each object/situation. The latter is also detected in the description of the DD teacher.

In other words, the participants set certain *requirements* for the employment of critical thinking. Knowledge in the above sense, as well as personal knowledge and familiarity with the subject/object of investigation is emphasised. Both the two principals, and Hernes illustrate how the students need everyday experience to evaluate information. Experience is also mentioned by the teachers of School 2.

Some of the traditional advocates, especially those who support the domain-specific character of critical thinking, refer to the role of knowledge, like Ennis and McPeck. Halpern

(1998) also acknowledges its necessity by prioritising the analysis of everyday societal situations and issues.

"The questions used to develop connected knowledge structures need to be drawn from the real-world contexts that are frequently encountered in the workplace and in the exercises of citizenship." (p.7).

Personal knowledge, however, is not always considered as 'valid' and 'objective', and is thus rejected.

The challenging approach adopts a view more similar to the participants. They regard knowledge essential, in order to achieve a better understanding of the various interacting factors, the importance of the context. Kincheloe (2000), for instance, acknowledges the significance of the personal knowledge of the students; they should try to understand the world from various perspectives, within political, economic, environmental contexts.

"[...] the depth of knowledge, understanding and experience [...] is a significant determinant of the degree to which they are capable of thinking critically in that area." (Bailin et al., 1999, p. 290).

Besides the requirement of possessing knowledge and experience, Hernes in particular, makes extensive reference to the importance of being aware of possible alternatives to the extant situations. This point is frequently mentioned in the challenging theories, like in Kraft (2000). She supports that a mere cognitive activity with analysis of information does not challenge the students to analyse from various perspectives and does not change the students/teachers' beliefs, as the information considered is not reflected upon critically. She supports that critical thinking should intrigue the students to question their own beliefs and assumptions, and thus alter the world- and their self-view. A corresponding analysis should address the social reality, fairness, benefits, and their possible alternatives.

Similarly, the male AA student mentions that the students can express freely their opinion, even when it is in opposition with what the teacher stands for. This indicates that an awareness and knowledge of the different perspectives is promoted. Concomitantly, the reference of the participants to the role of the other, also illustrates the above. Almost all conveyed the importance of co-operating with others under critical thinking, as they function as information sources, who provide another perspective.

Accordingly, Thayer-Bacon (2000) describes critical thinking as a communication process, where exchange of ideas takes place. The importance of being open to the other and his/her perspective is clearly highlighted.

The final element to be examined regarding the perception of critical thinking, is its function.

Not all of the participants referred to that point. Self-awareness and personal insight are mentioned by the DD students and student 1 from School 2. This concerns either one's knowledge, level of performance, or significance of the work executed.

From the traditional approach, only Paul (see Thayer-Bacon, 2000) refers to the above in a clear way, when he refers to the strong kind of critical thinking. Self-awareness is also mentioned by Thayer-Bacon (2000) and other proponents of the challenging view, who underline the understanding of the self in relation to the context, the insight in the personal views and beliefs held. Specific examples are drawn from Sarris (2000), who supports that the goal of critical thinking is self-understanding as a product of historical and social events, and Brookfield (1991), who states that;

"When we think critically we become aware of the diversity of values, behaviors, social structures, and artistic forms in the world. Through realizing this diversity, our commitments to our own values, actions, and social structures are informed by a sense of humility; we gain an awareness that others in the world have the same sense of certainty we do -but about ideas, values, and actions that are completely contrary to our own." (p. 5).

Moreover, Hernes talks about critical thinking promoting understanding, particularly of the extant norms and situations. The teachers from school 2 also include comprehension of the relation between theory and praxis.

Sarris (2000) mentions that understanding in the sense of apprehension is a goal of critical thinking; Ennis (see Allegretti and Fredercik, 1995) says that;

"Critical thinking has many functions, such as [...] (d) understanding and coming to a resolution in complex problems." (p. 46).

The first DD student also mentions that critical thinking prepares for the exercise of criticism, in the sense of evaluation. Lipman (see Johnson, 1992) supports it facilitates good judgement, which has some similarity with the above. Ennis (see Thayer-Bacon, 2000) also claims critical thinking helps us evaluate judgements. Still, albeit similar, the traditional view

refers to 'good' and 'correct' evaluation according to universal rational rules, whereas the DD students pertaining to another type of criteria.

Hernes is the only one to clearly state that critical thinking also elicits the production of novelties, be it ideas or objects. This is supported by Bailin (see Thayer-Bacon, 2000), who says that critical thinking involves creativity, in order to create novelties. Adams and Hamm (1994) indicate the same, when they refer to the role arts play in critical thinking, as they contribute to the creation of original ideas, and lead to the unconventional.

Finally, the first DD student touches the issue of the character a critical thinking analysis can take, meaning positive or negative. She claims it could be both, and this is why the students learn how to deal with criticism.

The same topic is discussed by Brookfield (1991), who remarks that critical thinking can be initiated by both positive and negative events, and might lead to positive and negative results, accordingly.

"The pejorative associations surrounding the word *critical* have meant that advocating critical thinking is a form of social or educational bad taste. Being critical is seen to have harmful consequences,. Such as destroying others' motivation or causing irreparable harm to their self-image [...] Within most circles then, being critical is regarded almost wholly as a negative activity." (p. 35; emphasis in original).

One more reference should be made, namely to the issue of transferring critical thinking to other areas than the ones taught at. Principal 1 hints at that direction; she doubts that the training the students receive at school enables them to make analogous judgements within their everyday lives. It could be suggested that the opposite is implied by Hernes, when he says that the training the students get, should make them capable of demonstrating critical thinking outside the school frames. However, Hernes refers to the continuous analysis of similar issues outside school, whereas the Principal refers to the transformation of the process in other areas.

As seen above, all theories include suggestions about that aspect of critical thinking. The majority supports the instruction of skills within a certain context. Ennis, Paul and Siegel for instance, claim it can be generalised, whereas McPeck categorically states the opposite.

To sum up, other aspects of critical thinking the data unveil include the presence of certain conditions to be satisfied. The traditional approach translates that into cognitive skills and abilities, general or specific. The data, however, seems to encompass them in the very process of critical thinking, and does not identify them in an explicit way. They refer mainly to personal

interest and willingness to engage into critical thinking. The participants rather describe other requirements to be fulfilled, like knowledge and personal experience, the discovery of alternatives. The challenging approach has a similar view on the issue. Its advocates purport that critical thinking asks for social skills and other types of tools, like emotions and imagination. They acknowledge particularly the presence of the other, thus being in agreement with the research findings.

It should be however noted at that point, that the above does not imply that the cognitive, mental skills are not involved in critical thinking. The data provide indeed analogous information, when for instance, considering learning strategies. Such techniques were shown to be useful tools in the demonstration of critical thinking. Nevertheless, there is not a big explicit focus on trainable cognitive skills as the traditional approach conveys. The participants are more concerned with other type of requirements for the application of critical thinking, which do not highlight mental competencies.

Finally, when it comes to the function of critical thinking, the self-awareness and understanding the participants describe is found in both approaches, whereas the creation of novelties only in the challenging approach.

Concerning now the *application* of critical thinking, a comparison between the data and the literature is made on the issues the participants refer to, meaning;

- a) *when* and *how* critical thinking is applied, and
- b) the role of contextual *factors/milieu*.

Corresponding information from the literature is found on the above table under the category 'instruction'.

Firstly, the participants identify specific cases *when* critical thinking is applied in the classroom.

Hernes refers to the examination of familiar to the students situations, and of the established form of the objects. The students realise that there is not only one perspective to view things from, and reveal the reasons hidden behind the extant forms. In other words, the discovery of alternatives takes place under the investigation of well-known, everyday situations.

Most of the literature that includes the awareness of perspectives, can be said to express the same meaning. Paul (1990) emphasises the need to make the students aware of the fact that for each situation met, an alternative exists; he talks about the importance of examining everyday

reality from various perspectives.

"[...] we ought to encourage the student as soon as possible to recognize that in virtually every area of our lives, cutting across categories every which way, there are multiple conflicting viewpoints and theories vying for our allegiance, the possible truth of virtually all of which calls for shifts in our global perspective." (p. 110).

Similarly, challenging theorists like Adams and Hamm (1994) support it is important to show to the students that an issue has many perspectives, that it can be investigated through many ways. In order to achieve that, they suggest the analysis of the extant stereotypes and morale.

Pink (1990) expresses Hernes clearly by saying;

"[...] the major purpose of education should be to empower students to think critically about their culture and their place in it. To achieve this end, teachers need to make the commonplace problematic for students by raising to the level of consciousness the taken-for-granted-assumptions, beliefs, values, and practices of the culture." (p. 139).

Furthermore, quite some participants refer to the need of using practical assignments in order to train students into employing critical thinking. Hernes, Principal 1 and Principal 2 explain why and how engagement into practical assignments can train the students' critical thinking; through, for example, the production of a theatrical play, or the evaluation of the physical aspects of the object.

None of the traditional advocates refers to practical assignments explicitly. The ones who include praxis in the training of critical thinking are the advocates of the challenging approach. Thayer-Bacon (2000), for example, talks about addressing the students' physical senses in order to enable critical thinking. She views the students as having a 'bodymind'; she and the other theorists do not separate thought from action, thus involve practical training in critical thinking. Adams and Hamm (1994), for example, discuss the use of objects, so as to explain theoretical concepts. This is in agreement with Hernes's physical examination of a spoon, in order to introduce theoretical issues about evaluative criteria.

Still, considering in particular the descriptions of School 2, the participants convey a distinct interrelation and interaction between critical thinking and practice. The students are both *trained* in critical thinking through the engagement in practical assignments and *demonstrate* it under the execution of such assignments. Principal's 2 emphasis on the priority of praxis over theory, for instance, is an illustration of the above process. Teacher 2 states that evaluation of the

indicative factors, which critical thinking includes, is done not only under praxis, but with the help of praxis; meaning that the students physically touch, see and hear the car in order to check own assumptions and arrive at conclusions. This kind of application is not clearly met in any of the literature.

Moreover, Hernes refers to the presentation of new knowledge by being based on the extant knowledge of the students. In that way, the students are enabled to make the necessary connections and are able to elaborate various concepts.

The same is supported mainly by the challenging approach. Adams and Hamm (1994) discuss instruction which integrates new knowledge into the personal experiences of the students.

"To be most effective, teaching must respond to students' prior knowledge and ideas. Resisting the temptation to control classroom ideas, teachers must *listen* as much as they speak, [...]" (p. 55; emphasis in original).

The individual's experience is hence recognised and highlighted; the context and the self influence the process of critical thinking. Sarris (2000) urges for the significance of using the students' own experiences as a stimuli and object of a critical thinking analysis; the students should be made conscious of the socio-cultural systems they carry with them. Sarris uses the term 'chasm' to describe the extant critical thinking instruction, meaning that there is a distance between life experiences and critical thinking, knowledge the students have and what they read in the school textbooks. This is in accordance to what Principal 1 and Hernes underline, the importance of referring to the students' everyday experiences.

Similarly, Brookfield (1991) demonstrates the value of personal experience with a series of studies on adults and critical thinking; he supports critical thinking is more intense during adulthood, as people have more life experiences.

The acknowledgement of one's own experience is actually in antithesis with some of the most traditional representatives, who view personal prior knowledge as an obstacle to good, 'objective' critical thinking. Those rather put weight on teaching the students background knowledge, or the knowledge of the field, but not on involving their personal experiences. As seen also above, when Halpern (1998) presents in detail what is not considered valid for critical thinking, she implies that the value of personal experience is not high. In expressing this view, Martin (1992) states;

"[...] analyses of critical thinking focus on rationality and logic [...] they

consider the uniqueness and complexity of individual people, situations, and events as problems to be disposed of, and personal feelings and relationships as obstacles to be overcome." (p. 168).

Another reference regarding the application of critical thinking, is made to learning and working methods that promote active student participation. The Pedagogical Leader, Principal 1, the female AA student, refer to the use of project- and group-work, which train students into various aspects of critical thinking by setting them responsible for the main phases of the working process. The students are forced, for example, to carry out assessment of information, take central decisions, understand and explain, evaluate the results.

Lipman (see Thayer-Bacon, 2000) hints at this direction by suggesting that dialogue is a good method of training students into critical thinking, thus implying active participation during the lesson. Halpern (1998) also suggests the same, in a way, as she proposes teaching of cognitive skills that enable students to manage their own thinking processes.

However, the above is limited to pure mental processes, which do not always include physical activity, social exchange, communication, participation of the body, in other words elements that the participants refer to under active student participation.

The challenging approach expresses the above in a more conspicuous way. Kraft (2000) urges for a democratic classroom, where the students have ownership for their own learning. Adams and Hamm (1994) claim critical thinking instruction asks for active student learning, where exchange and creation of ideas, co-operation with others, and exploration takes place.

The data also include references to the evaluation of one's work as an example of critical thinking application. The teacher of FO explicitly elaborates this point; the DD teacher and students, as well as the male AA student mention working journals and other instances where work evaluation takes place; teacher 1 from School 2 talks about evaluation of the learning method. When being engaged in such an evaluation process, the students assess various central aspects of the work in relation to the goals and standards involved.

Most of those belonging to the traditional approach support that the students be trained into evaluation. Halpern (1998), for instance, underlines that the evaluation of the outcomes and the thought process itself should be learnt, through instruction of cognitive and metacognitive skills.

However, a main difference between those assertions and the data is that the latter refer to concrete evaluation of usually a practical object or a piece of work, based on set goals and standards that pertain to this particular object or type of work. The traditional advocates, though, most often refer to teaching evaluation by following rules of logic and canons of a general nature, not connected to a physical object or to praxis. Analytical skills and logical principles are the object of study, in contrast to the participants' reference to context-dependent criteria.

The challenging approach argues mostly for an evaluation of the sources involved. The acknowledgement of the power forces and reasons hidden behind the specific formulations or facts provided by the textbooks, for example, is a way to apply critical thinking (Kraft, 2000). Still, the aforementioned engagement with practical evaluation that the data reveals, is not explicitly stated by this approach either.

Parallely, the participants of School 2 particularly mention the direct assessment of the working object, and the discovery of a problem's solution in praxis, as a way to train critical thinking. The consideration of multiple indicative factors in relation to the object's nature and to the feedback received from physical signals, together with theoretical knowledge is mentioned as training into critical thinking.

This type of instruction can not be found as such in the literature. As seen above, the challenging approach especially makes references to praxis, but not in the same way as School 2. The nature of the work gives a particular form to critical thinking, which has not been met in the current literature.

Moreover, the AA teacher supports that engaging the students in debates is a way to train them into critical thinking, as then they have the chance to provide arguments, and evaluate ideas from various perspectives.

Theories from both approaches include the above, departing, though, from different points. Halpern (1998) provides a list of skills to be taught, which includes argument analysis and hypothesis testing. Adams and Hamm (1994) claim critical thinking instruction should include presentation of moral dilemmas and debate.

"In group debates on content areas, students can see a number of thinking processes and learn to merge them into their personal repertoires [...] such shared thoughtfulness and searches for meaning can connect to social struggles of our times, maintaining a vital link between the school and students' daily realities outside the school." (p. 24).

The above excerpt demonstrates the difference between the two approaches; the traditional one sees debate necessary so as to develop corresponding skills, whereas the challenging one considers it as a step toward better comprehension. The AA teacher leans more toward the traditional approach.

A relevant issue to the application of critical thinking is the '*where*' of the instruction. The participants do not refer to that as a separate category, but the fact that their experiences are context-dependent implies that corresponding training takes place in relation to the subject-area. The teachers and Principal of School 2, for instance, indicate critical thinking is integrated into the students training, it is what the training as a whole addresses. Besides, the instruction of learning strategies takes place in both ways, with certain principles being taught in general, and applied in particular subjects.

The literature presents contradictory assertions; Lipman, McPeck and the challenging approach support that critical thinking is subject to context, Paul, and Siegel lean more toward the general approach, whereas Ennis supports a mixed one.

To sum up, the participants refer to various cases where critical thinking is applied in the classroom. The analysis of established ideas and situations is something both approaches include. The use of the students' personal and experience is acknowledged only by the challenging approach, as the traditional one rather adheres to more 'objective' types of knowledge. The execution of debates finds the traditional approach in agreement. Finally, the working methods that promote active student participation, the engagement with practical assignments, and the direct involvement of physical objects, are instances mentioned only by the participants. The integration of praxis in critical thinking application, in the comprehensive manner that the participants convey, cannot be located in the literature.

The next category to be examined is the *contextual factors* which influence the application of critical thinking.

The teacher's attitude is one of the factors that pertain to a favourable milieu for the demonstration of critical thinking. The participants here touch different aspects of the teacher's role.

Hernes and the male AA student refer to the importance of the teacher stimulating the students' interest in the subject, and motivating them to engage in analysis and elaboration. The challenging approaches agree on that.

Hernes also underlines the significance of making the students aware of their own knowledge and skills, something that the challenging approach also mentions. Kincheloe (2000), for example argues for the importance of promoting students' self-awareness.

The specific teaching methods employed are also essential in the employment of critical thinking, according to Hernes, and the two first teachers of School 2. The teacher's ability to accommodate to the students' needs and to the situations met, also belongs here. The students' individual characteristics, knowledge and abilities have to be considered in order for critical thinking to be promoted in an effective way.

McPeck (1990b) supports the teachers themselves should be able to demonstrate an analytical kind of thinking. The challenging approach purports that teachers' should model critical thinking, allow time for reflection and provide feedback. Hernes argues for the same.

"Teachers should be modeling critical thinking behaviors, setting the tone and atmosphere for learning." (Adams and Hamm, 1994, p. 34).

Likewise, Principal 1 indicates that when the teachers have an attitude pertaining to critical thinking themselves, then they also promote and encourage critical thinking to their students. Pink (1990) indicates the same, when referring to the general purpose of education. This is not viewed as transmission of knowledge, but as critical investigation of one's position in the society and of one's culture. The teachers should think critically first, in order to train the students to do so as well.

An attitude of openness is considered important for the demonstration of critical thinking by Principal 1, the second DD student, the male AA student, and Principal 2. McPeck argues for the same; the proponents of the challenging view underline the willingness of the teacher to abandon his/her professional authority and intrigue the students to express their own opinion.

Moreover, the male AA student refers to the importance of having a secure milieu, where one feels safe to take risks. Siegel (1992) implicitly includes that with his reference to the emotional security one should have. The challenging advocates illustrate such factors clearly, as they are the ones recognising feelings and emotions participating in critical thinking.

When it comes to the factors depending on the student, Hernes mentions the students' awareness of his/her own knowledge and skills. Those from the challenging approach who urge for the promotion of self-awareness state the same.

Principal 2 and the teachers from School 2 underline the importance of the level of the students' training, as well as the presence of learning difficulties. Principal 2 also emphasises the degree of engagement the students show. As seen above, the traditional literature points out various skills and abilities the person should possess, like the ability to reflect and judge; Siegel (1992) addresses also the psychological health of the person. In that sense, the participants of School 2 lean toward this direction, as they put weight on the inner qualities of the students.

Finally, the subject seems to play a role in the demonstration of critical thinking. Hernes supports the subject's nature is influential as far as the specific way of employing critical thinking is concerned. On the contrary, the AA teacher and students support that some subjects are not amenable to critical thinking, depending on their content and structure.

McPeck (1990b) is the only one who makes explicit reference to the subject's nature by agreeing with the AA participants. He particularly refers to mathematics and it being not offered for critical thinking demonstration.

The challenging approach, however, has a different view. Speaking specifically about mathematics, Appelbaum (2000) supports that it should not be related to rationality or clarity of thought, and provides certain teaching strategies that promote critical thinking in that area. Among them is the suggestion that the students invent ways to solve problems on their own, thus realising that mathematics is a human construction; everyday situations should be used. Agreeably, Hernes illustrated the presentation of basic mathematical concepts with the use of the construction of vertical buildings.

"[...] many people want to clutch the (false) certainty of mathematics as a scaffold to critical thinking, while others believe that strong basic skills in mathematical calculations are a prerequisite to their *later* application in critical thinking. I am proposing that we turn this around. Starting with the critical thinking that our students bring with them, we create experiences through which we can recognize occasional instances of apparent certainty and through which we can develop conceptual understanding that leads to a cultivated collection of calculation skills." (Appelbaum, 2000, p. 52; emphasis in original).

Likewise, Adams and Hamm (1994) state;

"To learn mathematics successfully, students must construct their own understandings, examine, represent, solve, transform, apply, prove, and communicate. This happens most effectively when students work in groups to discuss, make presentations, invent, impose their interpretation on what is presented, and create theories that make sense to them, thinking critically and in terms of relationships. How a student structures these subject matter relationships will depend on such factors as the

student's maturity, physical experience, and social interactions, all of which are also enhanced by cooperative learning." (p. 188).

Moreover, the possibility to execute practical assignments and everyday situations in each subject is mentioned by Principal 1 as a factor determining the application of critical thinking.

Agreeably, Adams and Hamm (1994) acknowledge the same by discussing the lack of connection between for example math teaching and everyday application. They present analogous teaching methods that promote this relation, such as the use of sun to teach geometry.

"[...] there is little doubt about the discrepancy between school mathematics and mathematical applications in the real world. Our real mathematical problems have little to do with what has traditionally been taught in many classrooms or the information found in most math textbooks [...] thus, many students do not see the point in mastering material that is detached from the world outside of school." (p. 181).

The volume of the subject material also concerns Principal 1, in the sense that it sets strict time limits that do not allow training into critical thinking. The same is supported by the female AA student, and Principal 2; they also include the significance of the exam goals. The latter namely prioritise what kind of learning will be promoted, meaning rote memorisation or learning pertaining more to critical thinking. Finally, Hernes brings up the issue of the teacher's education, as it might counteract the promotion of critical thinking

The importance of such educational requirements is also acknowledged by McPeck (1990b), whereas the other traditional theoreticians do not make any reference to the issue. The challenging approach discusses also similar topics; examples are the societal values, the class size, issues of evaluation, conceptions of knowledge, that have not actually all been indicated by the participants.

To sum up, the data regarding the factors influencing critical thinking application, seem to have more elements in common with the challenging approach. The latter namely attributes more responsibility to factors external to the students, like the teacher's attitude and the subject's nature. The teacher's role is the main determinant of critical thinking application, depending on whether the teacher has the will and knowledge to motivate the students, adapt to their needs, make use of the proper material, function as a model for the demonstration of critical thinking. The traditional approach, however -with a few exceptions- is more concerned with the individual -here the student- and his/her role in critical thinking. The skills and abilities required are the

focus, whereas the contextual factors are either not acknowledged at all, or considered as a minimal influence.

After having examined the data constituents in relation to critical thinking literature, their relation to theories about learning strategies is elaborated.

4.2.2. Learning strategies literature and the participants' experiences

Two main areas are included here; the type of learning strategies employed by the data and their relation to critical thinking.

4.2.2.1. Learning strategies content and instruction

The learning strategies literature addresses four main research areas; the definition of learning strategies, their content, their instruction and assessment. The data does not include all of those areas, but provide information mainly on the *content* and *instruction* of learning strategies.

Concerning *content*, the participants refer to four groups of strategies.

Firstly, they identify pure 'theoretical' strategies, which aim at reading comprehension and memorisation. Examples are; reading the whole of the material, keeping notes, underlying, writing key-words, reviewing previous exams, adopting various perspectives, various memory techniques. Both students and teachers from the two schools referred to them.

Similar strategies are also dealt with in the literature, the so-called 'cognitive' learning strategies. Chamot (1993) for instance describes them as those strategies employed while processing the learning material, which enhance in other words understanding and memorisation.

Secondly, the data describes strategies of a more 'controlling' function, which address one's thoughts and actions. Among them are; consideration of the goals set, knowledge of the evaluation criteria, pondering over the working process, self-assessment. In addition, strategies addressing management of one's working environment and oneself are also included in this group. Such examples are; choosing a quiet place to study, being concentrated, knowing one's best way to learn.

The above strategies are characterised by the current literature as 'metacognitive' strategies. They are active during monitoring and evaluation of one's work, (Du Bois & Staley,

1997), enable control over the information processing (Chamot, 1993; Davidson-Shivers et al., 1997), aim at self-awareness (Quicke, 1994).

Thirdly, the participants describe strategies that include the other. Specific references are made to; practice in communication, observation of and close exchange with others, execution of group-work.

Such strategies are labelled as 'cognitive/affective' in the literature. Fleming & Walls (1998), for instance, refer to techniques that enhance co-operation with others.

The first three groups of strategies the participants mention, are all located in the literature; the fourth one, however, is not. Specifically, some participants from School 2 refer to the strategy of comprehending theory via trying it out in practice. That indicates direct involvement of the body and immediate participation of the physical senses in the elaboration of the various theoretical considerations. This finding adds to the current literature, as the latter limits learning strategies to pure mental activity. Indeed, some of the theorists like Chamot (1993) include both thoughts and actions under strategy employment. However, 'action' in that case is interpreted for example in the drawing of diagrams for better understanding. The actual employment of practice in order to comprehend theory is not indicated in the literature.

The second issue the data implicates is the *instruction* of learning strategies.

As mentioned also in the first chapter, three areas are of main interest here; the teacher's and the milieu's role, as well as the specific case of students who suffer from learning difficulties.

Firstly, the data indicate that the attitude of the *teacher* regarding learning strategies is rather important. The usefulness the teacher attributes to the application of learning strategies is namely the chief determinant of the extent to which they are involved in the lesson. Those teachers who do not believe learning strategies are necessary for the achievement of the learning goals, do not promote their training and use. This often occurs when the subject is of a practical nature; learning strategies are considered as addressing only theoretical issues, their use in practical assignments being thus gratuitous. In other words, the teacher's perception of what strategies are and where they can be applied is rather limited. The potential learning strategies carry to be beneficial under practical work is not acknowledged in that case.

The influence of the teacher's beliefs about learning strategies is also acknowledged by the literature, for example in Duffy (1993). He underlines the importance of the teachers

possessing corresponding knowledge, meaning of knowing what strategies are and how they can be taught.

The data elaboration demonstrates this lack of instruction on learning strategies. The descriptions of the 'teacher's role' mostly include teacher's actions which provide the student either with the direct answer to the problem posed, or with direct instructions on how to proceed with his/her work. Very few cases indicate instruction of techniques that enable the students to proceed in an autonomous way. This implies lack of knowledge on or awareness of the significance of the promotion of learning strategy use.

It is also found that the instruction of learning strategies does not always take place because the teacher assumes the students already possess that kind of knowledge. Learning strategies are considered an object of learning pertinent to previous schooling; the students are expected to know what to apply and when, and further practice on such techniques is rarely promoted.

This belief that the students 'knows best' is also mentioned in the literature (see Ornstein, 1994; Baumfield & Oberski, 1998). It is a rather commonly met teacher attitude, which the students experience as lack of external intrigue.

Besides, the emphasis on types of learning which do not promote employment of learning strategies, like rote learning, counteracts the instruction on learning strategies. The data reveals that the teachers of some subjects feel obligated to prioritise the exam goals, which do not usually ask for knowledge on learning strategies. Those teachers also often face a big volume of curriculum to be covered, another factor that does not leave time for learning strategy instruction and practice.

The time pressure posed by the amount of the learning material is acknowledged also by Baumfield et al. (1998). Davies (2000) discusses the character of the exam goals and how it influences strategy use.

Moreover, the teacher's beliefs about the significance of student participation in the learning process has a lot to say. Some of the students, namely, refer to the importance of being allowed to express their own opinion and oppose the teacher. Such an attitude of openness implies also more freedom for the students to take own initiative and be involved in an active way in the main aspects of the learning process.

As Tabulawa (1998) explains, a teacher with an authoritative attitude is not willing to provide time and space for learning strategies, and does not promote their use.

Finally, the data highlight another influential factor, namely the teacher's belief about what successful learning strategy use depends on. Specifically, when the teacher considers this an ability depending on biological factors -the developmental level of the student- the instruction of learning strategies is rather limited.

Hamman et al. (2000) discuss the same issue; when the teacher believes learning is an inherent ability, s/he does not acknowledge the usefulness of learning strategies and consequently excludes them from the lesson.

Summing up, the findings concerning the teacher's attitude and instruction on learning strategies are all detected in the literature.

The influence of the school *milieu* is a factor closely connected to the above. The data demonstrate the importance of the school promoting active student participation. Specifically, when the school encourages independent learning and student initiative, promotion of corresponding learning strategies takes place. The same is detected when the school considers it important to adjust to the individual students' needs; it then promotes learning strategies which enable autonomous learning.

However, as the data elaboration uncovers, the above is mostly supported by the teachers. The students do not experience learning strategy promotion at the same degree as the teachers convey. The students rather feel a lack of corresponding training, as the schools do not usually employ organised efforts for learning strategy instruction in a long-term perspective. With the exception of an obligatory short course in the beginning of the first year, it is usually up to the individual teacher to include learning strategies later on.

The literature points at this direction (see Baumfield et al., 1998), when it underlines the importance of having a supportive to learning strategies school milieu. Active student participation should be promoted, meaning providing the opportunities for project- and group-work, prioritising learning goals which ask for independent learning, offering individual assistance. However, the data shows that even though the above are included in the school's intentions, the teacher's attitude has more weight on the actual application of learning strategies in the classroom.

The third issue the data provide information on, is *learning difficulties* and learning strategy use. This mainly concerns School 2, as its participants refer quite extensively to the subject. Specifically, the teachers and the principal believe their students face serious problems with carrying out basic learning demands, like achieving reading comprehension. Hence, they concentrate primarily on promoting learning strategies which enable understanding of the written text. Those are not only of a pure theoretical nature, but involve praxis, as seen earlier. The teachers mention also individually adjusted techniques and use of the two-teachers system.

Indeed, learning strategy instruction of the above kind is supported by for example Pressley et al. (1993).

However, a closer analysis of the content of the 'teacher's role' reveals that the teachers do not encourage autonomous actions which could enable learning, but provide a quite clear instruction on the actions that need to be taken. Most of the teachers express that the students need close guidance, as they lack the necessary knowledge and skills to execute the assignments given. At the same time, the school conveys a main policy of limiting the amount of theory to the absolute necessary, as the students cannot deal with the demands posed by it.

The above is categorised by the literature to the beliefs limiting the potential of those students who suffer from learning difficulties (see Edmunds, 1999). The scholars support that perceiving those students as being weak in learning, or having restricted abilities to learn effectively are mistaken. They rather urge for educating those students on how to develop self-regulation, self-awareness and metacognitive skills (Zimmerman, 1996). The case of School 2 seems to convey what the literature views as counteracting to efficient learning attitudes. Instead of equipping the students with the necessary tools, the school chooses to remove what the students cannot deal with. It indeed adjusts to the students' individual needs, but not in the most beneficial way, according to the literature.

Summing up, the findings regarding factors which influence learning strategy instruction, as well as those pertaining to the students with learning difficulties are in accordance with the corresponding extant theories.

What remains is the examination of the learning strategy findings in relation to critical thinking and the corresponding literature.

4.2.2.2. Learning strategies and critical thinking

The data analysis conveys information on the role of learning strategies in the employment of critical thinking. Learning strategies are shown to be tools necessary for the application of critical thinking.

The participants refer to the examination of the information as pertaining to critical thinking. Accordingly, the learning strategies they identify regard reading comprehension and elaboration usually of a written text. Those techniques are hence directly involved in the employment of critical thinking -as experienced by the participants. Concrete examples are; methods to examine the information acquired, like underlying or isolating key-words, and ways to achieve comprehension, like keeping notes of the most important parts or looking for the meaning of the text. The participants also refer to the acquisition of additional informational sources, for instance, which contributes to the adoption of various perspectives, essential in critical thinking.

Moreover, critical thinking is found to comprise of the evaluation of one's work. Concerning in particular practical subjects, the participants mention strategies addressing the making of judgements and decisions with regard to the working process. Specific strategies mentioned are knowledge of criteria and practice of communication. Those indicate examination of the product's (physical) aspects in relation to the goal set, explanation of the actions taken in the achievement of the learning goal.

Moreover, the value attributed to the learning strategies, particularly by the two principals, demonstrates directly their relation to critical thinking. Principal 1 supports they enable the students to deal with the big volume of material; this addresses information elaboration and comprehending. Principal 2 claims strategies help the students deal with the future working demands, signifying comprehension and extracting meaning out of the written text.

The literature agrees with the above, as information processing, for instance, is considered necessary to the application of critical thinking (see Davidson-Shivers et al., 1997). The theories about metacognitive strategies and critical thinking are also relevant; they demonstrate the importance of for instance monitoring to the development of self-awareness, a factor pertaining to critical thinking.

At the same time, the close connection between learning strategies and critical thinking is illustrated in the cases where strategies are absent. The analysis shows how the students experience of lack of training in critical thinking is related to lack of training into learning strategies. The students feel they are not enabled to carry out all the assigned tasks, as the teacher does not promote autonomous learning with the instruction of corresponding strategies, but rather provides direct answers. The school opportunities offered do not suffice for the demonstration of critical thinking when knowledge on analogous techniques are missing.

Moreover, when the students are considered to have low school proficiency, they are not taught strategies which enable independent learning, but are offered close guidance. The result is that the students are not able to carry out the assignment independently, they ask the teacher for immediate help, and feel left alone. Lack of knowledge on learning strategies does not facilitate the application of critical thinking.

In addition, principal 2 does not focus primarily on learning strategies, as she considers them relevant only to theory. At the same time she acknowledges that the students are not able to execute the given assignments, due to lack of skills, among others. Absence of learning strategy training is translated in an inability to employ critical thinking efficiently.

Those theorists who argue for the link between strategies and critical thinking, are hence supported. Day & Elsknin (1994) for instance, illustrate how knowledge on learning strategies enables active student participation, in other words independent and autonomous learning.

Finally, the participants of School 2 indicate that comprehending the connection between theory and practice is pertinent to critical thinking. One of the strategies applied in that case is trying out in praxis what is learnt in theory. This signifies a clear relation between learning strategies and critical thinking.

Summing up, the close connection between learning strategies and the employment of critical thinking conveyed by the data, is also acknowledged by the current literature.

What now remains is the parallel examination of the data with the information acquired by the student ombudsman.

4.2.3. Student ombudsman and the participants' experiences

At the present section, the interview data provided by the student ombudsman is seen parallel to the participants' data. This comparison elucidates the findings, by providing information that can elaborate further the observations and comments made during data analysis.

Starting with the students' role and actions within the school arena, the ombudsman refers to the issue of responsibility, as presented in the educational guidelines; the students should be responsible for their own learning. In spite of what is stated in the documents, the ombudsman claims that the actual duty of the students is to execute the teachers' instructions.

"Saying it in a popular way, the students are responsible to do what the teachers tell them to do, when they tell them to do it, and in the way the teachers tell them to do it. That's the responsibility the students in the secondary school have." (p. 2).

There are naturally variations in the degree the above occurs; the determining factor is whether the new roles are adopted. Specifically, the new teacher role asks for less execution of control, and shared authority with the students. Previous experience with the students' executing the central aspects of the learning process enables such an application.

"[...] in Norwegian I would call it 'spissformulering', you have variations. Some schools and some teachers have done this for several years and have much experience and are working very well with students, it's a problem that teachers have problems with giving up the control. They have this need to control students, to know that the students are working well and assure that the best students can pass the exams which is coming in May, that's a problem. But, for me, it's meaningless to talk about responsibility if you don't talk about control, or power. You can't have responsibility if you don't have power or control to make choices which will affect the result. That will be meaningless and that's the problem." (p. 2).

The student ombudsman elaborates further how the teacher and the role assumed influence the application of students' responsibility. He indicates that when the students are considered equal to the teachers, regarding knowledge and power over the lesson's structure, then it is easier for this responsibility to be actualised. The students' individual way of learning is taken into account, the teacher is attentive to the students' needs.

"[...] I see it like, the relations between the teachers and the students are more equal, they have left their traditional roles and are looking upon each other as more equal, which is working against the same goal. The goal is as much learning and the best learning for the individual student, and that's their common goal. And that's what lies in the bottom. And here the teachers have given the control away, the power to decide what to do, the way to do it, how to do it. Not in the way that they say 'OK, you are a

student, do as you wish' it's in communication or something..." (p. 3).

Hence, when the teachers are willing to share this 'authority' regarding the planning and execution of the lessons, then the students are given the opportunity to assume responsibility for their own learning.

The above can be detected in the participants' data. Starting with the ombudsman's claim that the students are actually carrying out the teachers' instructions, the male FO and female AA students express something similar. While discussing the learning strategies they use, both students indicate that harmonisation with the teachers' goals and expectations is the main way according to which they organise their studying. They follow, in other words, what the teacher suggests as the central thing to do, indifferent of their own preferences and aims.

Agreeably, Principal 1 emphasises the fact that the school tries to keep an equal status between the students and the teachers; it is considered essential for an active student participation. Moreover, she indicates that when the teachers assume an attitude open to inquisition, they welcome the students to exercise criticism on authority, themselves included; they demonstrate, thus, a spirit of equality.

Besides, the teachers from School 2 underline the efforts made to accommodate to the students' way of learning. The individual needs are taken into account under the instruction, so as to achieve effective learning results. They view this as a condition for training into critical thinking. The same priority to the students' own preferences regarding the specific instruction methods to be used is implied by Principal 1, when she describes the participation of the students into the central aspects of the learning process.

Furthermore, the ombudsman explains that teachers need to learn how to carry out the above. Analogous courses are offered at a high frequency, but usually the teachers fail to realise their importance, and thus do not participate. Besides, the compliance to the guidelines given is not always forced upon the teachers, who -in other words- do not carry out their work properly.

"After Reform -94 it's been many-many courses for teachers in how to do the teaching, in how the students take responsibility. But teachers won't participate. The teachers who have need to participate in these courses, they won't. It's the teachers who have the right thinking about learning who participate, because they see the need.[...] The teachers, many teachers want not this kind of courses, but courses which take up the subjects they are teaching in. In Norwegian, 'faglig området' [subject area]. (p. 4) [...] But could we train the teacher to do a job? And in all other jobs, you have to do the job your superior tells you to do, and if you don't do it, 'bye-bye'! It's almost impossible to fire a teacher in schools."

(p. 8).

In addition, the teacher education is usually in accordance with the old perception of the profession, meaning it being of a high authority status, which does not recognise the contribution and responsibility the students can assume under learning.

"But the teacher education in the teaching places is quite different. And some of them are very traditional in how they train, and that's a problem. But some, for example in Tromsø, have moved quite a bit and have applied a thinking which may lie in all the Norwegian school reforms, [...] education, but there is quite a bit of difference between schools. So they are still making educational teaching which have learnt the old way of being a teacher. [...]" (p. 9).

Hernes indicates the significance of the teachers' education clearly. He refers to the responsibility of the teacher schools to train them into applying the appropriate instructional techniques. He also believes this is not taking place at the moment, thus being in agreement with the ombudsman.

The need for conducting courses for the teachers is also indicated by Principal 1. The school organises, for example, special seminars for those who are in close contact with the students, to learn how to better approach them and how to deal with eventual problems. School 2 does not mention anything analogous, even though Principal 2 expresses a certain need to educate the teachers further; most of them come from a working milieu and not a pedagogical one. It is thus implied what the ombudsman states; those who need such training, most often do not participate in it.

Moreover, the reference to that the teachers do not follow the educational guidelines is also detected in Principal 1. She namely suggests a change in the working agreement the teachers have, since it does not explicitly state the compliance to instructional techniques and methods, but only to the material volume to be covered.

The teachers, though, are not the only ones to get activated; the students are also expected to assume the responsibility given, to take advantage of the opportunities provided. Again, analogous instruction is necessary. The ombudsman explains that the students are not used to acting in such a way, as in the rest of their everyday lives this attitude of responsibility for one's actions and decisions is not promoted.

"[...] But it's also a problem that the students who come to upper secondary schools –which is my responsibility- have got no training in taking responsibility. We have a system which cares for students in

schools, but also outside the schools, it's not allowed to do a mistake and learn by the consequences of it. Because we have a system which cares how much, that's the problem.[...] students haven't learnt how to apply this control. " (p. 3).

In other words, the students are not otherwise allowed to take own initiative and suffer the consequences of their own actions. They have others taking care of that, something that does not enable the adoption of such an attitude of responsibility at school.

Principal 2 refers to the above when discussing the reasons for which her students are not willing to participate actively in their learning. She underlines that they are used to being passive at school, to receive ready-made information from others, and thus find it difficult to alter this attitude. The fact that some of the pupils are being driven to school by the teachers themselves, hints at the same direction. At the same time, the teachers of School 2 emphasise the importance of allowing the students learn through committing mistakes, thus promoting own initiative.

Besides, the analysis on the learning strategies taught indicates a lack of the necessary skills and methods required for the students to take charge of their learning in a complete way. As the ombudsman says, the students are not taught how to make use of responsibility, do not possess the necessary tools.

The ombudsman refers to the fact that the students have to learn how to use this responsibility; the natural way is to let the students make use of the method they learn best with. He supports that some of the teachers do not realise this rather apparent fact.

"[...] and that's the problem for the students who come today and aren't qualified to take responsibility. They have to train, because it's the whole point of [...] Nobody has asked them 'how would you do that? How do you learn best?'. And this is so obvious for me! I don't understand why some teachers or why a lot of teachers don't see and understand this. It's completely logical to me." (p. 8).

Even though the participants do not refer specifically to that, the first student of School 2 expresses a dissatisfaction with the lack of encouragement and opportunities to evaluate the learning methods, for example. That indicates that the attitude described above might be present in that case.

The ombudsman continues by saying that the teachers are dichotomised on the issue of the students' responsibility. There are both defenders and opponents of this notion; the latter usually either support the traditional teacher-student roles, or believe the students are not ready to assume such a role.

"It varies. Many teachers think this is a good idea, and that we should try to get it work, because some systems are, they see some students that are not mature enough to take this responsibility, they say, and I do not agree. But you also have quite a lot of the teachers, especially in the academic tradition, which think this is my work as a teacher, thus is my area, and I won't let the students into that, because I don't think they can do better than me, and then we have a problem, because then you have to ask the question 'What is, how do you look at humans, do you look at your students as humans?' I think sometimes it's the time to ask that question." (p. 3).

Furthermore, the kind of school tradition implicated, influences the above. Some schools still maintain the idea that the teacher belongs to an upper level regarding authority and power. Thus, they are not willing to let the students learn how to assume responsibility for their learning.

"I think it's the tradition in schools; it's the Christian old schools in Norway. In the old days, there was the priest and the resources man – landsman- and the teacher that was the upper class in Norway in small places. And they would control what the teacher did them. And this is still living inside the education sector. We are thinking still the same way. The teacher knows best. And the students have little or no insight in which rights they actually have. They don't know that they should participate in planning how to do the learning, to do the learning and to evaluate it, as we said earlier. They don't know. And the schools don't tell them. " (p. 4).

However, he supports the school culture is possible to alter, when the administrative leaders initiate and promote it.

"[...] Because I think you can change a culture with a systematic work, you can change the culture in the direction you want. It takes time, but if the leaders of the schools have a goal, and systematically work against that goal, it will bring changes in the culture." (p. 5).

Several places in the data contain reference to the above. The AA teacher, for example, supports that critical thinking abilities are biologically determined; not all students have reached such a developmental level that allows for independent thinking. The teachers from School 2 imply not all students are allowed to make major decisions regarding working issues, as they do not possess the certain level of experience required. They emphasise that it is the teachers who have the knowledge, which needs to be transferred to the students. Moreover, the female AA student refers to some of the teachers not being open and willing to accept criticism on the way they teach. Finally, Principal 1 emphasises the importance of viewing the students first as persons, something which promotes a state of equality between them and the rest of the school personnel.

In addition, the analysis of the school culture and the interrelations between the principals, the teachers and the students at school, implies the strong influence of the traditions to the educational realm. The beliefs and conceptions held at an administrative level determine at a considerable degree the acts and thoughts of the pedagogical personnel, and the consequences suffered by the students. As suggested earlier, a change in the tradition could mean a change in the everyday practice at school regarding learning and training issues.

Moreover, the ombudsman supports that many of the problems faced with the application of the curriculum are exactly because radical and quick changes in the school culture are required. Hence, a lack of appropriate knowledge is detected, when it comes to the specific techniques and methods to be used.

"[...] And this is again a problem we had with the Reform -94, which the minister in a hurry made this Reform as a [...] to the schools. And that was a major collision with the traditions and the culture in the education sector. I think it was the right thing to do then, and to challenge the sector in that way, but it is still showing that many teachers and many people in the sector have problems with the Reform, what they should do, how they should do it." (p. 5).

Hernes himself acknowledges the above when he suggests that the reason for the teacher schools not realising the significance of the core curriculum lies in him not communicating his intentions efficiently enough.

Parallely, each school's subject direction has a somehow different culture which influences the way learning is conceived and applied. The ombudsman attributes the changes found initially to the non-pedagogical background the teachers of the vocational direction have.

"[...] it's a difference in culture, the culture is very different from school to school, also between vocational schools and between academic schools. Partly it is of course because the vocational schools have teachers with other background than only academic training. They have been working as many different professions, and are taking the culture from these professions into the schools, and that will affect the school culture." (p. 5).

Principal 2 refers exactly to the same point. She implies that some of the problems faced with the application of the core curriculum are due to the type of education the teachers have. Moreover, the data analysis reveals the net of relationships between the principal and the rest of the school, the influences and interactions taking place. The role of the leader that the ombudsman discusses, is hence demonstrated.

Besides, the above emphasis on the teacher's role is also given by Hernes and Principal 1. They both underline that it is first the teachers that should be held responsible for promoting this particular kind of training, and not the students.

The ombudsman emphasises that the usual mistaken attitude is that of assuming that the students do not possess enough knowledge, and that the role of the school is to provide it. He, on the contrary, claims that the departing point should be what the students already know and are good at; their extant abilities should be used into an effective learning. He underlines that the teachers are primary responsible of that, as their goal is actually to educate the students in a holistic manner.

"[...] So it's the way to look at the students. They are coming to us and we can fill them up with knowledge, or we can train them, the starting point is that you can't anything. But that's not true! Everyone has different experiences and they are experts in...computers -computer science is always a cliché- it could be in soccer, and so on. But why don't we bring this knowledge and this experience into use in the learning society, which a class is? Why? And who should do that? That's the teachers' responsibility. Because this is not only about subject knowledge, it's about growing as a human being. And the schools' role in the Norwegian society as a cultural institution [...] (p. 6). [...] But personally, I won't change the schools into this economic thinking with a customer and an attributer of services; I think the schools are more important than that, I think –as I said earlier- [...] cultural institution in the society." (p.8).

Moreover, he supports that even if the students are not already equipped with corresponding knowledge and skills, upper secondary education is the place to actualise them.

"[...] And if after they have finished the primary school, or the primary education, if they haven't learnt it then, we have to start in upper secondary school, [...]" (p. 6).

Hernes discusses this point quite extensively; he argues for the use of the extant knowledge of the students in order to present new and more complex knowledge. He supports training should not be limited to the school arena, but transferred in the everyday life. Principal 1 also indicates the same; the importance of considering the students' own experience is highlighted. Moreover, she implies the promotion of education in its initial meaning, when she describes the way the school approaches students, firstly as persons and secondly as 'professional' students.

A further comment regards whether and how the core curriculum is given out to the students. The ombudsman emphasises the importance of demonstrating its gravity when

addressing the students; the proper attention to its function should be given. The same regards the presentation of the specific syllabuses.

"It's given out. In Nordland it's given out. But how do you present this? If you ask the teacher to say 'OK, this is the curriculum, for this subject, read it. It's not important, really, but you have to read it, OK?' Of course the students will not read it. Why should they? It's not important. Instead of the teachers are working with the students to understand what the curriculum is and how to use it as a tool to give a more effective learning, as it should be." (p. 5).

Even though the participants do not refer directly to the above, the fact that some of the students have not heard about issues included in the core curriculum implies that they have not elaborated it thorough enough. Besides, the Principal of School 2, for instance, explains that the theoretical part of the students' training is limited to the absolutely necessary, something which signifies not paying particular attention to the elaboration of general educational guidelines.

In addition, the schools must provide with the appropriate circumstances to active student participation. Mere theoretical explanation of the core curriculum does not suffice; the school must promote it in praxis. The ombudsman acknowledges that the limited school time is an obstacle to that, but supports nevertheless that it has to be prioritised, as analogous experience has given good results.

"They have to get the opportunity to train this. You can't only read about it. If you choose to learn to play the piano, it isn't any good that you have the book about playing the piano, you have to try it, you have to get the possibility to try and to be able to do these things, to do errors and learn from them. And this takes time. And this time we have to give them. [...] we need to spend time in this. And here we have the teachers I have talked with, who have tried this, say that yes, we used a lot of time in trying and trying and trying. It takes a long time, but about Easter, we catch up with the rest and we are passing them in progression in the subjects. But we have to invest that time and give the pupils the opportunity to train; only in that way will they be good to this." (p. 6).

The issue of time occupies many of the participants. Principal 1, the AA teacher, the female AA student, Principal 2 refer to the hindrances met when considering the time restrictions set on the school work and activity. Other goals and methods are thus preferred, in order to achieve the predetermined goals.

Furthermore, a chief reason for which some teachers give up the initial attempts to apply the core curriculum besides the lack of time, is the lack of immediate results. Namely, the exam

grades are not so high, which leads to the consideration of the efforts made as a failure and waste of time.

"Generally speaking, is that the things don't go after the plan.[...] both time-like and the results are not as good as they wished. [...] Yes, that [the grades] too and the products they produce aren't as great because they have never done this before. It's the first time. But then many teachers say 'OK, we tried it, it didn't work. Let's go back to the old things'." (p. 7).

The female AA student refers to the importance the grades have for one's future life, which makes her follow the conventional way of rote-learning. Besides, the prioritising of the exam goals which Principal 2 suggests, is done in order to achieve good results, which in turn means no deep engagement in the core curriculum guidelines. Principal 1 also mentions that the content of the exam goals counteracts active student participation.

Likewise, time pressure and the exam goals set the focus on how to go through the curriculum material, rather than how to learn effectively. The ombudsman supports the teachers are more concerned about the first, whereas the students about the latter.

"It's always dangerous to speak general, but let's try. The students often are more concerned about process than results. They experience variations in the lessons and the way their learning is organised as a good thing in itself; variation is good for the learning and motivation. The teachers are in most cases focused on the results and the time they use in this, on the exam, which is coming in May, on the curriculum, which has all this goals and we don't have time because we have to go through the book, and so on. It's all these problems, instead of being focused on the learning process and the individual student. [...]" (p. 8).

Even though the data do not provide explicit information on the above, the wishes of some students for more student participation hints at that direction. The female AA student, for instance, underlines the importance of the teacher being open to critique, as that influences the learning efforts the students make. The DD student complains of not having access to original sources, but being presented only with ready-made judgements; she thus implies a focus more on the process than on the results.

Besides, the teachers who refer to the time problems faced in relation to the goals set, demonstrate an emphasis on the results, as seen also above.

Moreover, the ombudsman refers to the necessity of providing a secure environment, where students and teachers can experiment with different methods and techniques, without being afraid of taking a wrong step.

"[...] And they have to get, feel safe about trying, that's a problem. Many

teachers are, they don't trust themselves or the students, or the system to try new things because it could be a fiasco. And that's a problem. And that is the leaders' responsibility to give every teacher safety, a safety net, security to try new things a maybe to do a mistake." (p. 7).

The importance of feeling safe to take risks is mentioned by the male AA student. Moreover, the fact that both Principals try to establish a close contact with the teachers, indicates the creation of an environment characterised by support and mutual trust.

Furthermore, the ombudsman suggests that certain things have to change in order to overcome the problems faced. The students, for example, should be allowed to choose their own learning material, so as to satisfy their own interests, and in order to use those informational sources in an active way. Thus, the textbook is not a goal in itself any longer, it becomes a tool of learning. Again, the ombudsman underlines the importance of giving the learning control to the students, as otherwise the above initiative and responsibility is not possible to be assumed.

"[...] I think we should and in Nordland we had it done some weeks; in Nordland they say that every student can him/herself choose which book they want to use in their own learning. And we have an example of mathematics, with five different books on the same time in the class, and that must have some consequences, how you organise the lesson. You can no longer have as a goal to get through a book during a year. You have to use the curriculum active, all the time. I also think we should stop giving homework in Norwegian schools. [...] Who is learning, who is the active participant in this we are doing now and further we could maybe at a greater degree give the student, not as in the university, with completely freedom, with the degree with the students' freedom to choose when they participate in a lecture or if they want to do something else. And in that way we change the power control. Less to the teachers who today have all the power and more power over to the students. [...] So it's somebody we have to respect, but we could in bigger degree than today shift the power to the students. Students who by law are old enough to become parents, but they are not old enough to decide if they should go to school or if they should stay home." (p. 8).

Hernes illustrates how the students' interests should be leading the instruction. Motivation in that sense is also indicated by Principal 1; she also supports students' initiative when for example describing the kind of assignments students of the practical subjects execute. The female FO and AA students suggest active student participation, meaning being responsible for the central aspects of the learning process; this is significant for the actualisation of the core curriculum. The teachers of School 2 suggest that the students are left to work independently, so as to discover the solution on their own.

Moreover, the issue of whether the students are mature enough to take up such responsibility has also been touched above; Principal 1 acknowledges an equal status between teachers and students, whereas Principal 2 believes they are not ready to take up responsibility due to their previous school behaviour and performance.

Finally, those principally in charge of checking that the situation at school is in accordance with the guidelines, are the principal, the leader of the education administration at the county level, as well as the Educational Office. However, the ombudsman acknowledges that the teachers are not being followed-up closely enough, there is no adequate control of the way they carry out the lesson. He also indicates that the aforementioned authorities are not strict enough with the schools; they rather provide feedback and offer help, instead of imposing the regulations. The latter occurs due to the tacit rule that such contacts should be characterised with politeness, conducted in a civilised manner. However, the ombudsman conveys that good communication means communication addressing the essence of the problems, and not the external features of the dialogue.

"According to the law, that's the headmaster of the school, and the utdanningssjef –the leader of the education administration- is responsible to check on the headmaster, and we have statensutdanningskontor, which is the government's or the national government's regional offices, have the responsibility to check on them. But we have a problem in the educational sector, [...] we have a 'styringsproblem' [control, governing problem], it concerns this control function, which is not taken care of. A teacher can go into his/her classroom and do a course as s/he likes and it's nobody who asks a question. If you don't sexually abuse the students or are drunk, you can do all as you wish. In the same way, a school does almost as they wish, choose to overlook the...oppfordra, the orders from the level above and it has no consequences. Statensutdanningskontor [State Educational Office], which by the law has this obligation to control the county government, don't do this, they say 'it's too bad, you have not done this, and you have to get better, and how can we help you', instead of saying 'this is not acceptable, you are breaking the law, you have to do something with this now! This is the student's right, do it now!' They don't do that. They have to have [...] to talk with each other, have good relations, I think they are misunderstanding what a good relation is when they are, the focus is wrong. So we have an obvious problem. Not always is taken care of." (p. 4).

The data also provide information about the control of the school function. Hernes clearly points out those in charge of controlling that the core curriculum is applied, who are the same persons as above. Both Principals, as well as the Pedagogical Leader acknowledge this duty.

At the same time, the data confirm the ombudsman's assertions. The Pedagogical Leader at the county level, describes her role in a similar way to the ombudsman. She explains that she mainly provides feedback to the schools and encourages them to operate in accordance with the guidelines, without, though, being as assertive as the ombudsman suggests.

Concomitantly, Principal 1 refers to the lack of clear rules that set the course for how instruction should take place; when she discusses the main changes that have to take place in order for things to improve, she also includes the teaching agreement.

She parallelly underlines the importance of having a clear communication with the teachers on instructional issues, as seen with the case of AA. Hernes also emphasises the significance of paying attention to the essence of the core curriculum and not its external features, indicating thus what the ombudsman suggests about good communication.

Besides, the analysis as a whole indicates a lack of clear and effective communication between all the parts involved, something that the ombudsman also hints at.

4.2.4. Summary of the section

In the present section the data was discussed in direct dialogue with the literature. This involved three main parts;

- a) the current theories on critical thinking and the data constituents,
- b) the current theories on learning strategies and the data constituents, and
- c) the information provided by the student ombudsman and the data constituents.

Regarding the first part, the constituents discovered in the participants' experiences of critical thinking are mostly met in the realm of the challenging approach. The traditional approach does indeed present common factors, but different meaning is conveyed to them.

Specifically, the traditional view includes theories which consider critical thinking more an individual function, limited to cerebral, cognitive processes. The person is required to possess cognitive and metacognitive skills, and by use of rules and principles that pertain to logic is expected to arrive at a correct judgement, supported by valid arguments. Some of the theoreticians, like Halpern, adopt a less strict approach, namely acknowledge the influence of personal goals and wishes in addition to that of the strict logic rules, but still discuss critical thinking within the above frames. In other words, the theories pertinent to this approach do not adequately cover all the nuances of critical thinking, especially when practical work is involved.

In addition, they are much more rigid in the criteria suggested, whereas the participants relate the criteria closely to the nature of their subject. Likewise, the traditional approach argues for skills and abilities that the participants see not as requirements but rather as tools.

The challenging approach, however, has a different view of critical thinking, as a human constructed tool, evolving and changing in accordance with contextual influences. Its perception is closer to the data findings, as it acknowledges the role of the context, the participation of the body, the importance of the other. Critical thinking is not reduced to pure cognitive forces and mechanisms, the self is not alone in the process. People co-constitute meanings, and critical thinking is part of it. The students know with both brain and body, and utilise creativity, feelings, emotions and intuition under critical thinking demonstration.

Still, deeper data investigation reveals aspects of critical thinking that the literature does not include. Those regard the actual use of praxis under critical thinking employment. The participation of the physical senses, the role of the bodily feedback, the direct involvement with physical objects unveil a unique combination of theory and praxis that cannot be detected in the current literature. Moreover, the comprehensive way the theoretical or practical nature of the school subject influences the specific manner in which critical thinking is promoted and demonstrated, is not to be found in the literature, either.

Thus, the data offer new constituents concerning the perception and application of critical thinking, valuable information that elucidate the phenomenon from different perspectives and expand its horizons of possibilities.

The second part regarded the findings on learning strategies and the literature. A close resemblance was found between the two. Examining first learning strategies per se, the *type* of strategies employed, and the *factors* influencing their application are acknowledged by the extant theories. Specifically, regarding the content of those strategies, the participants include all the three groups identified by the literature, namely cognitive, metacognitive and social/affective strategies. However, the data also provide with a unique finding, namely a type of strategy which involves practical action directly, as a means to comprehend theory.

Moreover, concerning the contextual factors, the role of the teacher's attitudes, as well as the characteristics of the school milieu are detected in both the data and the literature. Similarly, the findings concerning students suffering from learning difficulties and use of strategies indicate attitudes and beliefs also identified by the literature. Finally, a close connection between learning

strategies and critical thinking is conveyed by the data. The first compose necessary tools for the application of the latter. The literature is again in agreement.

The third part comprised of the parallel examination of the data and the information provided by the student ombudsman. This comparison addressed various issues involved in the students' learning which can be also related directly to critical thinking training and application. Many common elements have been revealed, meaning agreement between the ombudsman's experiences and the experiences of the participants.

Specifically, the significance of the teacher - student roles and the school culture is acknowledged. The ombudsman explains that students cannot assume responsibility for their own learning before the teachers become willing to abandon their position of authority and share it with the students. This requires analogous education, for both parties. The teachers on the one hand need to learn which methods and techniques to apply, and the students on the other hand how to make use of the opportunities given. The school has to ensure the provision of appropriate circumstances for active student participation, which involves changes in the traditional school policies. Corresponding variations can be found between the different subject directions.

Moreover, both the data and the ombudsman convey that there are certain attitudes and beliefs that need particular consideration. Those concern the perception of the supported requirements for an active type of learning. Weight should not be put on the students' abilities, but rather on the teacher's actions. Certain contextual factors can compose potential obstacles to the application of the above, but experience has shown they should not be considered the main reasons for abandoning the efforts made.

Finally, the experiences of the participants demonstrate that those in charge of controlling that the schools act according to the current guidelines are not as assertive and efficient as the ombudsman supports they should be.

In other words, the data provide information relevant to the issues pointed out by the ombudsman, with concrete illustrations pertaining to various groups and subject directions. This indicates that the elaboration of the participants' data can be enriched by use of the information provided by the ombudsman. Possible explanations for certain situations can be given, and connections between elements can be made. The ombudsman's experience with similar problems the participants are concerned with, is sometimes indicative of the actions that need to be taken.

Likewise, the contextual factors and their relations conveyed by the data can provide the ombudsman with knowledge indispensable for the effectiveness of his work.

Besides, the similarity found between the two indicate the value of the findings; it implies that the findings are germane to a broader area than the one obtained from, always under similar contextual frames.

The above is made more clear in the chapter that follows, which includes the presentation of the contribution of the present study.

CHAPTER 5: CONCLUSION

This final chapter is divided into four main parts; the summary of the study, its contribution, its critique and some suggestions for further research.

5.1. SUMMARY OF THE STUDY

The present study investigated the phenomenon of critical thinking within the upper secondary education. The main goal was to uncover the meaning of critical thinking as conveyed by the individual experience. For this purpose, the method employed was based on the phenomenological psychological method.

Two types of schools were chosen; School 1, which provides university entrance qualifications and School 2, which offers vocational training. Regarding School 1, students and teachers from three different subject directions participated (FO, DD, AA), together with the Principal. The participants from School 2 were students and teachers from three classes of mechanical subjects, as well as the Principal. Moreover, the Pedagogical Leader at the county level and the Minister of Education at the time Reform -94 was set in action, also provided data.

The contextual frame was core curriculum and the way critical thinking is described in it. After the participants had read the two corresponding paragraphs, they were interviewed on critical thinking, its perception and application in the classroom. Moreover, the issue of learning strategies was addressed. Wherever possible, specific descriptions of the phenomenon were obtained.

The results were presented by use of comparison. Specifically, three major axes guided this presentation. Firstly, the experiences of School 1 and School 2 participants were elaborated, each school seen separately. Secondly, the two school cultures were investigated by direct comparison of the two schools. Finally, the experiences of Hernes and the Pedagogical Leader were examined, in relation to the other participants, so as to reveal the metamorphosis of critical thinking from theory into praxis.

The above revealed the particular way critical thinking is perceived and applied in the classroom; it is dependent on the context and content of the students' training. Specific factors influencing the appearance of the phenomenon were uncovered. The role of learning strategies was demonstrated. Similarities and differences between the groups were detected, and the net of interrelations and interactions between the various participants was described. Furthermore, the various forms critical thinking took, from its theoretical formulation in the core curriculum to its everyday school application were elaborated. Mechanisms involved in the communication between school level and administration level were also revealed.

In addition, the results were elaborated with reference to the corresponding current literature. Two main informational sources were used; the current theories pertaining to critical thinking/learning strategies and the student ombudsman. With regard to the first, common elements between the data and the literature were identified, together with new aspects introduced by the data. The comparison of the data with the student ombudsman's experience offered further information that elucidated the findings, at the same time as it demonstrated their value.

5.2. CONTRIBUTION OF THE STUDY

The results of the present study provide information that addresses two main areas; critical thinking within the psychological-educational sphere, and the Reform –94, mainly in relation to the core curriculum application. In addition, implications about school praxis and the method used are drawn.

5.2.1. Critical thinking and the research findings

The most distinct finding concerns the very features of critical thinking. The data reveals that *the meaning the participants bestow to critical thinking is situated*. The nature of the school subject and the particular characteristics of the students' work influence the way critical thinking is both perceived and applied. This is expressed specifically in the chief division between theoretical and practical subjects; critical thinking involves either analysis at a pure theoretical level, or direct involvement of praxis, of a physical object.

As seen earlier, there is a kind of tension between the traditional and challenging approaches addressing the issue of critical thinking being context-laden. The present data clearly show that critical thinking is not an abstract concept, as the traditional theorists tend to believe, but is rather formed in accordance with contextual factors.

Moreover, the data illustrate a unique integration of theory and praxis in the employment of critical thinking, which signifies a joint participation of bodily and mental activity. *Critical thinking is not limited to the cerebral; both body and mind are involved, in a harmonious synthesis.* In some cases it is even impossible to exclude the participation of the body, as the feedback it provides is indispensable to the assessment process.

Consequently, the dominant theories of critical thinking which highlight its mental side, almost exclusively, are proven inadequate. The theories adhered to the challenging approach, however, bestow a broader meaning to the phenomenon, since they argue against the division between body and mind, between the knower and the object of knowing.

Nevertheless, *the particular way the data incorporates praxis in the very process of critical thinking is not to be found in the current literature. This finding is unique; it broadens the horizons of possibilities of critical thinking, at the same time as it inflicts the new perspectives its instruction should be viewed from.*

Moreover, the data demonstrate that critical thinking involves the use of standards, which are also context-dependent. The particularities of the work involved determines the type of criteria used. Those could be socio-cultural rules and practices in the case of a theoretical elaboration, or elements related to the physical aspects of an object, in the case of a practical evaluation.

Once again, the challenging approach seems to be closer to the research findings. It assumes, namely, that critical thinking is a constructed tool, functioning under the contemporary historical and cultural frames; the latter determine the specific criteria used. The assertion of the traditional view that critical thinking pertains to universal, 'objective' criteria is not supported by the data. *Critical thinking is not the infallible, 'valid' way of thinking, but a tool, which contributes to understanding within context.*

Accordingly, critical thinking does not involve only criteria which pertain to the pure mental sphere of logic, as the proponents of the traditional approach claim. The participation of the body is obvious under critical thinking, particularly in the case of the practical subjects. The

physical senses function as evaluation tools by providing feedback. Emotions are also present; they either function as criteria for an evaluation, or are directly involved in the process, both evoking it and being evoked by it. In other words, *the findings highlight the emotional and bodily sides of critical thinking which have been neglected by the dominant theories.*

Parallely, critical thinking is a process not carried out in solitude. The presence of the other is strongly underlined by the data. The other participates in the employment of critical thinking either as an informational source or as a discussion partner. *The traditional notion that critical thinking is a sole mental activity that centres on the self, is thus abandoned.*

In addition, critical thinking is not always limited to the execution of an examination or evaluation, but can also lead to a creation. This could be either a novel idea or a discovery regarding the solution of a problem. In that sense, *'critical' signifies two major nuances; system-bound and beyond the system.* The first has a finite and restricted character, whereas the latter an infinite and unlimited one.

This type of contradiction is actually not encountered in the current literature; the double message that critical thinking might carry has not been underlined in such an explicit way.

It is indeed found that critical thinking poses certain *requirements*. Those include *personal* factors, like effort, interest, care, willingness, learning proficiency, development level; elements that can be *learnt*, such as experience, knowledge; and *external* factors, such as favourable milieu, the subject's nature, the teaching techniques. The data provides thus information that is in agreement with both sides of the critical thinking theorists.

However, the participants give certain emphasis on those factors that are external to the students. Meaning mainly the teacher's role in the initiation of critical thinking, in the use of the appropriate topics and methods to promote such a process. This finding indicates *the need to remove the spotlight from the individual and his/her abilities that the traditional theories convey.* The focus becomes instead factors outside the individual's sphere, namely the contextual influences that the challenging approach are concerned with.

Correspondingly, the data convey bigger attention to the possession of knowledge than to separate cognitive skills and abilities. The descriptions rather incorporate the latter in the very process of critical thinking, instead of posing them as required qualifications to be possessed from before. The data hence signifies that *the specific skills and abilities, which the traditional advocates name on various lists, are not experienced in such a mechanistic way.*

Instead, *particular attention to the students' own experience is paid*. The significance of involving it in the promotion of critical thinking is particularly emphasised. This finding is in contrast to the traditional view which does not acknowledge almost at all the value of personal experience.

Furthermore, it is shown that *the application of critical thinking has direct consequences for oneself*. Those could be both positive, like comprehension and insight, and negative, like an one-sided focus on certain aspects of the object/situation. In some cases it can also initiate personal action. This finding is quite important, as not all the theories refer to how critical thinking influences oneself; they rather concentrate on the benefits it has for the achievement of a goal or for the abstract management of reason assessment. *Critical thinking becomes more personalised, a tool which conveys meaning for the one who uses it*.

5.2.2. Practical implications

The significance of the above findings is further highlighted when their consequences for the type of characteristics attributed to critical thinking and subsequently for the specific instructional methods adopted, are examined.

The finding that critical thinking and the standards involved are context-dependent, alters quite radically the suggestions regarding training into critical thinking; *the need to consider the contextual factors is highlighted*. A different instructional approach is thus indicated, where knowledge about the socio-cultural and historical factors under which the object/situation in question is developed, is emphasised instead of a unilateral focus on abstract concepts. The students should not be over-loaded with training on specific cognitive and metacognitive skills and abilities, but should be made aware of the current net of the underlying factors, the circumstances and interactions which co-act under the formation of the objects and situations.

Accordingly, it is suggested that more emphasis should be paid to the structural characteristics of the various subjects, instead of focusing on large volumes of facts to be memorised. In that way, the students become able to identify the constructing forces found behind the subject-area, and can thus make various connections between knowledge areas.

Likewise, *the students' own knowledge should be used under critical thinking training*. The value of personal experience needs to be acknowledged, and viewed not as an obstacle, but as an advantageous factor. The students should be intrigued to apprehend their experiences and

use them when evaluating and investigating various issues. They should learn to appreciate their own knowledge and trust it under the everyday school activities.

Moreover, critical thinking requires the harmonious synthesis of body and mind. Once the emotional and physical aspects of critical thinking are acknowledged, serious consequences regarding critical thinking promotion take place. *The educational aim ceases to be the development of mental abilities and functions, and becomes the cultivation of the person as a whole.* The students should be motivated to mature in a corresponding manner, by developing the awareness of the physical senses and the apprehension of their role under critical thinking. Analogous training should be designed, which includes the participation of the body, and uses it as a tool of critical thinking.

Parallely, *the theorists should expand their conceptions about critical thinking by including a broader repertoire of both mental and bodily actions,* instead of having a limited focus on the theoretical navigations of the mind. The school subjects of a practical orientation can thus benefit from a more comprehensive perception of critical thinking; particular ways to develop critical thinking within such frames can be identified. Accordingly, students attending subjects which are traditionally seen as non amenable to critical thinking, like mathematics, will start enjoying the benefits of including critical thinking in the subject's instruction and application. The students can give meaning to what they learn, and utilise their knowledge in a more efficient way.

In addition, *the emotional side of the students should be addressed.* Showing and encouraging care and empathy for the other, for example, belong to the groundwork of critical thinking. The necessary interest in one's surroundings has to be promoted by use of intriguing examples that the students are curious about. Moreover, the students' emotional security has to be taken care of, in a classroom milieu where initiative and daring thoughts and actions are promoted. The students should also learn not to ignore the emotional consequences the various incidents have for them, but rather use them as a departing point for a critical thinking analysis. Likewise, the students should learn how to deal with the various emotions which arise together with critical thinking application.

Communication is another area that the students need to be trained in. Critical thinking requires co-operation with others; the analogous skills and techniques have to be promoted. The classroom structure should allow close exchange between the students, and the assignments

given should include group- and project-work. Various ways to deal with possible communicational problems should also be addressed, together with the development of the will to listen, accept and appreciate the others.

Furthermore, *the consequences critical thinking has for oneself should be used in order to highlight the critical thinking value within the educational realm*. Critical thinking promotes comprehension and personal insight, which are included in the main goals in one's training. The contribution of critical thinking to the education of the students in a comprehensive way can thus be shown easier; those who are hesitant to acknowledge its importance can be easier convinced.

Finally, *the possibility of critical thinking to be conceived of as being contradictory has to be examined*. The students might receive a double message from the teachers, who urge for the use of pre-determined standards and rules, at the same time as they promote an inquisitive spirit. The connection between the two needs to be made clear, so that the students do not feel insecure and confused about what they are expected or even allowed to do. The teachers should explicate the necessity of knowing the extant norms, in order to surmount them.

An analogous attitude is thus required from the teacher. The data demonstrate vividly the significance and gravity of the teacher in the critical thinking process. *The core characteristics of the teacher's role, as identified by the participants, should be taken into account when designing educational programmes for the teachers*. The corresponding attitudes have to be promoted, thus providing the students with the favourable milieu they ask for.

5.2.3. Learning strategies and the research findings

Learning strategies was the sub-topic of the present study. Preliminary information regarding learning strategy and function was obtained.

Data on the content of the strategies reveal a belief that learning strategies are mostly pertaining to the theoretical subjects. *The participants of the practical subjects have difficulties in acknowledging their contribution in the particular type of training and thus do not promote their use*. This concerns mainly the DD subject and School 2.

In other words, the participants fail to 'see' a broader use of strategies while being engaged in practical activities, whereas at the same time convey a lack of corresponding techniques. Hence, the experiences indicate a need to include learning strategies in the students'

training, as their application can facilitate the execution of the various tasks, even of a pure practical nature.

The literature is not occupied with the above finding. Learning strategies are examined usually from within a theoretical frame, and address students' activities that are mainly of a mental character. *The data indicate a need to focus more on the practical subjects and their assignments, to consider the particularities of their content in relation to learning strategies.* The extant theories need to expand in that sense, to make more direct references to those subjects where practical training is central.

Accordingly, *the extant theories need to include strategies that are not limited to the pure mental.* As seen from School 2, practice is directly employed as a learning strategy; it facilitates theoretical comprehension. This kind of strategy cannot be located in the extant literature; examples provided by School 2 are good indicators of what the field lacks. The extant theories convey a unilateral focus on theoretical education, which excludes practical training. If learning strategies are to be beneficial for all students, the latter must be given particular emphasis.

Moreover, the data communicate the role of learning strategies to the application of critical thinking. They are necessary tools for the execution of the acts involved, mental or physical. As the literature claims, *lack of training in learning strategies is interpreted in lack of training in critical thinking.* It is particularly the students who convey such a feeling.

The above indicates also *the need to concentrate more on the perceptions of the teachers and the students.* The data reveals the presence of discrepancies between the two groups, regarding the role of learning strategies in one's training, as well as the need for a more extensive training into them.

Likewise, *the role and attitude of the teacher asks for particular attention.* The data stresses, namely, the significance of the teacher's actions and beliefs for the instruction and employment of learning strategies in the classroom. Even when the students acknowledge the importance of applying learning strategies, when corresponding motivation is not provided by the teacher, the students abandon strategy use.

Finally, *the particular teacher attitudes related to the learning ability and learning strategies need to be addressed.* As the data indicates, beliefs that the ability to apply learning strategies is biologically determined, limit learning strategy instruction, as the teacher feels unable to intervene with the students' development.

5.2.4. Reform –94 and the research findings

In order to examine the relevance of the findings to the Reform -94, the results pertaining to the school culture, as well as the literature discussion with the information obtained by the student ombudsman are taken into consideration.

It should be initially noted that the results on critical thinking give also implications for other phenomena included in the core curriculum. Such suggestions are made in the presentation that follows; however, they should always be seen in relation to the context the experiences take place in, and not be generalised in an abstract manner.

The main finding which addresses Reform -94 and the application of the core curriculum in particular, is the influence of the *school culture*. The structure of each school and the net of the established relations, have a lot to say for the way critical thinking is perceived and applied.

Primarily, *the degree of engagement with the core curriculum* by those pertaining to the administrative level has to be examined. Principal 1 and 2 differ in the way they approach the core curriculum and in the attention they pay to it. When the core curriculum is not prioritised as the main goal of the school function, certain sub-goals like critical thinking might be overlooked, independent of their high importance. As seen from the analysis, *the attitude of the principal is a crucial factor influencing the attitudes of the teachers, and subsequently the practical consequences suffered by the students*. It is thus quite important to make the principals aware of the core curriculum's function, so that a corresponding milieu can be formed at school.

Furthermore, it is shown that *the degree and content of communication between the various groups participating in the school realm, is a strong determinant of a common conception and application of critical thinking*. Established contact praxis between administration, teachers and students, enables a more immediate access to the everyday situation as experienced. We saw, for instance, that the lack of direct contact between Principal 2 and the students has unfortunate consequences for the promotion of critical thinking at school.

Likewise, when examining the application of such complex phenomena included in the core curriculum, the communicative patterns within each school need to be addressed. *The actualisation of the core curriculum guidelines is likely to fail if an adequate and efficient contact is not established between the various school participants*. Particular attention should be paid to the student group, as the students are usually left out of this network of interactions. Their voice has to be heard and taken seriously into account, if certain goals are to be achieved.

Besides, the contact between the Principal and the students has to be addressed in more detail; the fact that the Principal does not have to teach, for instance, determines at a large extent the degree and type of the above communication. Being in the classroom with the students is the only way to get immediate access to the real problems faced.

Parallely, *the communication between the teachers and the students needs to be addressed, as in general, certain discrepancies are found between them.* Specifically, this diversity addresses critical thinking and the help given/taken, the level of responsibility given/practised, the evaluation/beliefs on teachers' work, the student ability to carry out tasks, the meaning of the educational goals. Those are issues that also underlie other guidelines in the core curriculum, and thus relevant to its application.

Moreover, what the school offers to the students has to be examined. As seen from the data, *the students consider a favourable milieu one of the main factors determining the application of critical thinking. They expect analogous opportunities from the school,* something which seems also to be a considerable motivational factor for them. When they are namely intrigued to examine the established norms, to evaluate the learning methods, to question the teacher, the students demonstrate corresponding activity.

Agreeably, the guidelines posed by the core curriculum ask for action from the school's side. *What should be addressed is whether the school makes organised efforts* for the creation of those circumstances that enable for example active student participation, co-operation and group-work, an atmosphere of openness and encouragement for the students to take initiative.

An additional factor that has to be taken into account is the actual structure of the school. The application of critical thinking is enabled by the structure of School 1, which comprises various subjects within the three directions. This structure is prolific for the execution of interdisciplinary work, for instance. Moreover, the fact whether the training has direct connection to the working life, is also another factor to be taken into account. As seen from School 2, this fact adds another dimension in how instruction takes place, as the consequences of the students' acts have implications of another kind.

Hence, *the particularities of each school have to be examined, when it comes to designing and promoting programmes which aim at student participation.* Not all the instructional suggestions can be applied in the same way in each school. Special considerations have to be made, if such training is to be effective.

A factor closely related to the above is the status teachers and students have at school. As seen particularly at School 1, *equality characterises the relations between the teachers and the students; this implies shared authority regarding the main aspects of the learning process*. The students are given the opportunity to use methods that enable critical thinking demonstration, as autonomous action is respected and promoted.

An analogous remark can be made regarding the core curriculum guidelines which refer to student participation and responsibility for learning. *The school's attitude toward authority issues can reveal possible problems* with for example active student participation under the planning and execution of the instruction.

Parallely, the roles assumed by the teachers have to be taken into account. The data illustrate that those teachers who are open to inquiry and promote informational analysis, for example, are perceived as encouraging for critical thinking demonstration. Besides, the ability of the teacher to adjust and adopt to the students' need is also shown.

Concomitantly, *the beliefs the teachers hold about learning and knowledge are significant*. The AA teacher, for instance, indicates a conviction that critical thinking requires abilities biologically determined, something which sets strict limits to its promotion. A teacher from School 2 supports that the teachers possess knowledge, that needs to be passed over to the students. The special instructional techniques used do not address so much independent learning, but rather better comprehension.

Likewise, *the beliefs held regarding the students' abilities and their importance in learning have to be looked upon*. The two schools have a quite different approach regarding what is required for the application of critical thinking. Too much focus on individual skills and abilities can be both counterproductive, and restraining for alternatives to emerge.

As the core curriculum suggests that the students develop certain capacities, the above is rather actual. The educational world must acknowledge the fact that *a certain amount of field knowledge and cognitive ability is not always the condition for effective learning*. Instead of requiring pre-determined skills from the students, the latter's extant proficiency should be the departing point. As Hernes clearly states, the students know much more than they are aware of. The teacher's role is to make use of this kind of knowledge.

Moreover, the data make reference to other, more specific topics relevant to the application of the core curriculum.

Firstly, the obstacles that the subject's nature poses to the employment of critical thinking, raises the issue of *whether all the guidelines can be applied at the same ease within all the school subjects*. The participants consider it difficult to include assignments of a practical nature in all the subjects, for instance. Time limits and exam demands are chief factors that determine how and when the promotion of critical thinking takes place.

Concomitantly, *the data reveal that the specific way the core curriculum guidelines are formulated does not always pertain to all the types of subjects*. The DD teacher, for instance, states directly that the exact words used to describe critical thinking in the core curriculum do not belong to drama. Hence, a re-examination of the specific utterances needs to be made, so as to avoid confusion and the feeling of that the core curriculum is foreign to one's subject.

Similar issues have to be examined in relation to other goals included in the core curriculum. *The particularities of each school subject need to be addressed* in a more detailed manner, as general guidelines are not pertinent in each case. The type and volume of the goals in the specific syllabuses, for example, have to be re-considered in close relation to the core curriculum. As seen earlier, a usual case is this of prioritising the latter over the first, due to exam press and the importance of grades. The issue of exams and evaluation must also be addressed in an analogous manner.

In other words, a more detailed examination of the individual issues contained in the core curriculum is necessary, in order for the general picture to make more sense for the school participants.

Furthermore, *the issue of the students' motivation asks for particular attention*. As seen from School 2, the main weight is put on the students and their low will to participate in the learning process. However, as Hernes repeatedly emphasises, it is the teacher's role to intrigue the students, to make use of situations interesting for them and present the knowledge in such a way that they can easily manage.

The demands of the teacher's role have to be looked upon more intensively by the teachers' schools, as corresponding education is the only means to achieve the above. *Teachers' training must be re-considered by taking into account such factors, and not only by focusing on the subject-knowledge*. As mentioned by Principal 2, when the teachers are not educated pedagogues, similar to the above problems occur. The teachers should thus participate in

analogous courses, where specific techniques and methods regarding how to approach students are addressed.

Besides, *learning strategies have to be dealt with*. The participants, especially the students, convey a dissatisfaction with the training into studying techniques. The courses offered do not suffice for the coming years, as they cannot answer the demands of the work required. Besides, learning strategy conception and function has to be re-considered. As seen from the data, very few of the studying techniques actually equip the students with the means necessary for the employment of critical thinking. It seems that the students are not provided with such knowledge, sometimes because it is assumed they possess it from before. *The organisation, duration, and content of the courses on studying techniques have to be addressed in closer connection with the demands of each subject*, and perhaps a more organised and conscious application of them within each subject has to be made. Better ways to control how the students understand and apply them are also required, as in many cases a discrepancy is found between the teachers' and the students' beliefs.

In addition, *the control of the core curriculum application has to become more rigid*. As seen from the data, those in charge of checking the employment of critical thinking do not always do so. The Pedagogical Leader brings up issues of a practical nature, the Principal 2 refers to the exam goals. The Department, in turn, seems to be unaware of the particular problems that hinder an effective control, as seen from the analysis around communication between the parties involved.

Likewise, the control of other issues included in the core curriculum has to be addressed in an analogous manner. In other words, the demands posed by the educational authorities must be re-considered in relation to the volume of work the Educational Offices have to go through, and to the school reality. The various topics have to be addressed in their essence, not in a superficial, technical way. Perhaps the schools must be given more freedom to first report their own problems, which are later categorised. This instead of what is happening now, meaning providing the schools with a report including issues chosen not by the schools' participants, but by authorities, who do not always have direct access to the schools' real problems. Accordingly, the contact the schools have with the authorities and the content of the corresponding discussions need closer examination.

In other words, *issues of communication between the various levels of the educational system need to be addressed, in order for the core curriculum to be applied in an efficient way.* As the analysis shows, critical thinking is not always applied as initially intended, due to communicative failures. The complex nature of the issues included in the core curriculum dictates a more detailed communication of their underlying purposes from the authorities side.

Finally, when examining the results parallel with the information provided by the student ombudsman, a significant correspondence emerges. As seen above, the problems discussed by the student ombudsman are identified also by the data. This gives a further basis on which the ombudsman's observations can be analysed from. On the one hand, the ombudsman's experience takes a certain gravity, and on the other hand the research findings can be seen from another, broader perspective.

Besides, the effectiveness of the ombudsman's role can be highlighted by such a correspondence. His remarks acquire a certain significance from the data, as it is shown that they pertain not only to the strict limits of the county he operates in, but to a broader area, taking the context under consideration.

5.3. CRITIQUE OF THE STUDY

Two main topics are addressed in the present section. The method used and the presence of the researcher.

5.3.1. The method applied in relation to the study goals

The present study had as a main goal to reveal the essence of critical thinking. The method employed departed from the phenomenological psychological method. It analysed the participants' experiences of the phenomenon, meaning both specific descriptions and more direct utterances.

The reason why descriptions are collected under the phenomenological psychological method, is in order to arrive at the structure of the phenomenon, meaning reveal its main constituents and the relation between them. Hence, the method variation I applied carries the

danger of ending up with separate themes, instead of structures, as the participants are not describing only specific instances of the phenomenon.

It is indeed apparent that the analysis cannot offer a clear structure of the phenomenon examined in the strict phenomenological sense. Thus, the main disadvantage of the method used is that it is unable to provide specific and general structures of critical thinking, and eventually uncover similarities and differences at that level.

However, a combination of concrete descriptions and general expressions was acquired. I was constantly operating under the phenomenological reduction and using the imaginative variation. The final results convey indeed the *essence* of the phenomenon, in what I call 'gestalt of meanings'.

In other words, what the present analysis has managed is to reveal the phenomenon in an integrated sense. This as opposed to both quantitative research and to pure thematisation of a qualitative kind.

On the one hand, the traditional research addresses thinking by reference to variables, categories, cause-effect relations, which imply an artificial fragmentation of the phenomenon. Simultaneously, certain issues are overlooked, for the phenomenon's characteristics are reduced to variables, which focus on particular aspects of the phenomenon only. For instance, traditional research on learning has neglected the students' voice.

On the other hand, analysis which leads to a thematisation of the phenomenon also implies an artificial fragmentation. The experience, namely, is not seen as a whole, is not approached in its *gestalt*. Rather, separate factors and elements are identified, which cannot though provide information about the relation between the individual parts, between the parts and the whole.

The method applied here, however, offered a broader, more comprehensive understanding of the phenomenon. The *constituents* found always function under the general gestalt of the experience; they take their form and meaning by reference to it. The study did not simply discover separated factors, which would not have revealed the phenomenon's essence, but demonstrated different expressions of the phenomenon, as formed within the context. It revealed a dynamic process, instead of a combination or correlation of separate concepts. It discovered the *meaning* the phenomenon has for the participants, as their experiences were examined in their contextuality and can be further elaborated by the acquired 'gestalts of meanings'. Moreover, the

network of interactions regarding the demonstration of critical thinking were discovered, within the particular school culture. Hence, the method has captured the phenomenon in its totality.

The only proof for the above is the parallel examination of the raw data and my analysis, a task pertaining to the scholar community.

At the same time, the present study composes a demonstration of how results obtained by use of the phenomenological psychological method can be applied in praxis. The data elaboration, namely, lead to clear implications of critical thinking application at school by making specific instructional suggestions.

Regarding now more specific points of critique, the interviews themselves are firstly examined. Even though a pilot study was conducted, still, the questions posed in some cases, did not investigate the various sub-themes in the best possible comprehensive way. Some meanings appear thus quite vague, as mentioned in various points during the analysis. A more thorough investigation would require a follow-up of the interviews, meaning to conduct a new interview with the same participants, in order to obtain clarifications where needed. However, as the distance between the data collection and the data analysis was quite big, practical reasons detected the non follow-up. Still, I believe I have captured the phenomenon of critical thinking in a satisfactory way, as demonstrated by the elaboration of the results.

Besides, the investigation on learning strategies needs to be commented upon. As learning strategies composed the sub-topic of the present study, only a preliminary investigation was carried out. The research questions posed addressed learning strategy use and instruction in a quite general way, basically aiming at the examination of their role in critical thinking. Hence, the results obtained should be considered as a platform setting the foundations for further research. Issues pertaining to learning strategies need to be addressed in a more detailed manner, as the present study cannot provide answers to for example issues of definition or assessment, or to the how of their instruction.

Parallely, the number of the participants was proven to be satisfactory. The data has namely uncovered the essence of the phenomenon, as well as various nuances of the phenomenon. A substantial picture of critical thinking can be drawn.

In addition, demographics were not taken under consideration in the present study. The schools which participated were city schools. Further examination of suburb schools, for instance, might have uncovered interesting differences. Likewise, the gender of the students was

not taken into account. The differences in the way the phenomenon is perceived by females and males would indeed address an additional aspect of critical thinking.

Likewise, the data could have been elaborated from various perspectives, by paying attention to other sides of the phenomenon. As explained in the introduction, the specific perspective assumed is a psychological-educational one, which emphasizes the practical implications and consequences critical thinking has for schools. The focus was to reveal which factors influence the appearance of the phenomenon within the context of the educational system, from the students to the Department. This implies that if another perspective were adopted, different aspects of the data would have been revealed.

However, such a work has to be limited in certain ways. Time and resource factors determine the extent of the present study.

Indeed, the generalisation of the present results should be done with caution. As shown above, the contribution of the study addresses mainly the nature and components of critical thinking, as well as its application. At the same time, certain influential factors are identified, where particular attention should be drawn regarding educational praxis.

However, the contextual factors have to be considered, in case of further use of the results. The findings should be seen firstly in relation to the description in the core curriculum, the particular level of education, the type of subjects involved, the school structure and culture. Only when those factors are secured, can we consider the application of the results in an analogous setting. Implications can also be drawn for other topics included in the core curriculum, but again within the above restrictions. The inclusion of another type of school, for instance, or of different subjects would most probably have given other variations of the phenomenon, additional factors to be considered. There are certainly limitations in that sense.

5.3.2. The researcher's presence

Some general comments on the actual research situation need to be made.

An important factor that can influence the data obtained, is the way the participants are in relation to the research situation and the researcher, as well as the very attitude of the researcher.

In the present study, two relevant issues emerge: whether the participants felt the researcher was actually exercising some kind of control over them, and a communicational issue, pertaining to language.

With respect to the first issue, I am under the conviction that the participants felt comfortable in discussing with me, and did not feel 'threatened' by my posing questions. Two elements support this belief:

a) I am not Norwegian, and thus not familiar with the Norwegian educational system. Accordingly, I presented myself to the participants as being a foreign student that wishes to discover how the educational realm Norway is; I stated being otherwise ignorant on the issue of critical thinking and its application within school. Analogously, the questions I posed were not of an aggressive nature that could provoke the participants and made them defend themselves; as it can be seen in the *Appendix*, the interview questions are of an explorative nature. Besides, most of the participants had already met me or heard about me when the pilot study was conducted, and were thus more relaxed and familiar to the situation.

b) Accepting that my student and being-a-foreigner status did not intimidate the participants, I also avoided any references to who my main supervisor is. Namely, a reference to his name and role in the schooling reality might have put a kind of pressure on the participants, as he is an established person in the area, and thus of a certain scientific status. Accordingly, I tried to address the participants as totally equals; I did not in any case give information that would signify authority or expertise from my side.

Regarding the issue of communication, two points need to be addressed:

a) The communication between me and the participants. As the interviews were conducted in Norwegian, a question regarding my use of the language unavoidable emerges; my experience with the language is not a very long one. Did the participants understand me? Was our communication successful? No evidence for that can be given, except from the transcribed interviews given in the *Appendix*. As it can be seen, there are very few, rather insignificant places where communication failed. We should also keep in mind that the significance of the data lies not in the individual words, but in the *meanings* conveyed.

b) My understanding of the language in relation to the data analysis. Did I conceive of - and subsequently present the meanings conveyed adequately? Again, in order to answer this question, the transcribed interviews and the written analysis in the *Appendix* have to be studied. I believe I captured the essence of the phenomenon in a satisfactory way; a corresponding presentation to my supervisor –who is Norwegian- proved not otherwise. I am convinced that when the analysis is seen in its *gestalt* -the parts in relation to the whole and vice versa- the

problem of language comprehension is not pertinent.

Having the above in mind, suggestions for further research projects are now made.

5.4. SUGGESTIONS FOR FURTHER RESEARCH

The aforementioned contributions and limitations of the study constitute the platform for further research. Hence, the following areas are addressed:

- issues of transfer and generalisation regarding critical thinking development and application. How is critical thinking best promoted? Does critical thinking training at school suffice for its application in other type of activities?
- issues concerning metacognition. What is its relation to critical thinking demonstration?
- conceptions of what knowledge is and what kind of knowledge should be promoted at schools. How do they interact with critical thinking?
- critical thinking at the subject-level. What are the differences found between the school subjects and how do they fit in the present 'gestalt of meanings'?
- the contradiction around critical thinking. How is it perceived and dealt with by the school participants?
- issues concerning gender. Are there differences regarding critical thinking perception and application?
- issues regarding school performance. What is its relation to critical thinking?
- creativity and imagination. What are the concrete ways they participate into critical thinking?
- group-work and project-work. The various phases of the work and the presence of critical thinking. What are the specific expressions of the phenomenon under each stage?
- issues addressing classroom reality; video-taping of lessons. How are the identified factors expressed in practice? What other interactions can be detected?
- closer observation of the way School 2 works. How is praxis integrated into critical thinking and expressed in concrete training situations?
- city and suburb schools. Are there differences regarding critical thinking perception and application?

- other school levels. What are the differences regarding critical thinking in the lower educational stages? In the upper ones?

- learning strategies. What are the specific strategies applied under critical thinking within each studying direction? What enables or hinders their use? How do the students and teachers perceive their importance in relation to critical thinking? How should learning strategies be taught; in relation to specific content or in a general way?

- attitudes of schools with a theoretical and vocational orientation regarding students. What to eventual differences concern? Where do the beliefs addressing the students' proficiency and school competency come from? How do they influence the students' own self-image? How do they influence the teachers' actions and evaluation process?

- other issues included in the core curriculum. Are the findings regarding school culture and communication actual?

5.5. FINAL REMARKS

The present study aspired to shed light upon the phenomenon of critical thinking. The study introduced a different approach to the investigation of critical thinking within the psychology field, radically different from the dominant one that makes use of quantitative methods and instruments. The results offer a fresh perspective on critical thinking perception and application by uncovering new aspects of critical thinking and their relations. The analysis conducted demonstrates the benefits the psychology discipline can have by embracing the phenomenological psychological method and by applying it on phenomena that have been traditionally examined within a quantitative approach.

Moreover, the examination of critical thinking was carried out in relation to the Norwegian upper secondary education. As most of the current critical thinking research pertains to the United States and their educational system, the present study offers unique findings pertaining to the Norwegian educational sphere.

The in-depth examination of the meanings conveyed by the participants lead to the discovery of original findings regarding the experience of critical thinking, in relation to both national and international literature. Indeed, not all the findings are not totally new, but they offer

a new way of understanding the phenomenon, as they allow an immediate access to the lived experience of critical thinking. The individual's perspective is highlighted.

My final intention is that the study is used in relation to clarifying central issues regarding the instructional side of critical thinking. The results obtained can hopefully contribute to the design of efficient instructional programmes and methods for the development and promotion of critical thinking. The hope is that critical thinking receives the attention it deserves, and students start enjoying its beneficial effects.

REFERENCES

- Adams, D. & Hamm, M. (1994). *New Designs for Teaching and Learning. Promoting Active Learning in Tomorrow's Schools*. San Francisco, California: Jossey-Bass Publishers.
- Allegretti, L. C. & Frederick, N. J. (1995). A Model for Thinking Critically About Ethical Issues. *Teaching of Psychology*, 22 (1), 46-48.
- Ambert, A. M.; Adler, A. P.; Adler, P. & Detzner, F. D. (1995). Understanding and Evaluating Qualitative Research. *Journal of Marriage and the Family*, 57, 879-893.
- Andersen, K (1996). Issues Related to the National Reform –94 in the Norwegian Upper Secondary School. In J. Lasonen (Ed.) *Reforming Upper Secondary Education in Europe: Surveys of Strategies for Post-16 Education to Improve the Parity of Esteem for Initial Vocational Education in Eight European Educational Systems* (pp. 187-191). Jyväskylä: University of Jyväskylä.
- Anthony, G. (1996). When Mathematics Students Fail to Use Appropriate Learning Strategies. *Mathematics Education Research Journal*, 8 (1), 23-37.
- Appelbaum, M. P. (2000). Eight Critical Points for Mathematics. In D. Weil & H. K. Anderson (Eds.) *Perspectives in Critical Thinking. Essays by Teachers in Theory and Practice* (pp. 41-55). New York: Peter Lang.
- Ashworth, P. (1999). "Bracketing" in Phenomenology: Renouncing Assumptions in Hearing about Student Cheating. *Qualitative Studies in Education*, 12 (6), 707-721.
- Aanstoos, M. C. (1986). Phenomenology and the Psychology of Thinking. In P. Ashworth, A. Giorgi & A. J. J. de Koning (Eds.), *Qualitative Research in Psychology* (pp. 79-116). Pittsburgh, PA: Duquesne University Press.
- Bailin, S. (1992). Discovery, Justification, and the Generalizability Question. In S. P. Norris (Ed.) *The Generalizability of Critical Thinking* (pp. 87-96). New York: Teachers College Press.
- Bailin, S.; Case, R.; Coombs, R. J. & Daniels, B. L. (1999). Conceptualizing Critical Thinking. *Journal of Curriculum Studies*, 31 (3), 285-302.
- Barrow, R. (1999). The Higher Nonsense: Some Persistent Errors in Educational Thinking. *Journal of Curriculum Studies*, 31 (2), 131-142.
- Baumfield, V. & Oberski, I. (1998). What Do Teachers Think about Thinking Skills? *Quality Assurance in Education*, 6 (1), 44-51.
- BDF (2001a). *Forslagene fra Ungdommes Demokratiforum*.
<http://odin.dep.no/bfd/norsk/barn_og_ungdom/demokratiforum/forslagene/004021-300020/index-hov001-b-n-a.html>
- BDF (2001b). *Norges Offentlige Utredninger, NOU 2001:6*.
<<http://odin.dep.no/bfd/norsk/publ/utredninger/NOU/004001-020002/index-hov016-b-n-a.html>>
- Bergli, T. (1999). *Reform 94 – Plan og Realiteter. Evaluering av Fire Studieretninger. Avslutningsrapport IV*. Bærum: Høgskolen i Akershus.
- Bjørgen, A. I. (1995). *Ansvar for Egen Læring. "Den Profesjonelle Elev og Student"*. (4. Opplag). Trondheim: Tapir Forlag.
- Bjørgen, A. I. (2001). *Læring: Søken etter Mening*. Trondheim: Tapir Akademisk Forlag.
- Boman, D. (1999, April 21). *Et 'Sputnik-sjokk' i Utdannelsespolitikken?*
<<http://tux1.aftenposten.no/meninger/kronikker/d78216.htm>>

- Borkowski, G. J. & Muthukrishna, N. (1992). Moving Metacognition into the Classroom: "Working models" and Effective Strategy Teaching. In M. Pressley, K. R. Harris & J. T. Guthrie (Eds.), *Promoting Academic Competence and Literacy in School* (pp. 477-501). San Diego, California: Academic Press, Inc.
- Borkowski, G. J.; Carr, M. & Pressley, M. (1987). "Spontaneous" Strategy Use: Perspectives from Metacognitive Theory. *Intelligence*, 11, 61-75.
- Bowman D. S. & Roth, J. (1993). General Track Students' Perceptions of School Policies and Practices. *Journal of Research and Development in Education*, 27 (1), 1-8.
- Brookfield, D. S. (1991). *Developing Critical Thinkers. Challenging Adults to Explore Alternative Ways of Thinking and Acting*. San Francisco: Jossey-Bass Publishers.
- Bråten, I. & Olaussen, S. B. (1998a). The Learning and Study Strategies of Norwegian First-Year College Students. *Learning and Individual Differences*, 10 (4), 309-327.
- Bråten, I. & Olaussen, S. B. (1998b). The Relationship between Motivational Beliefs and Learning Strategy Use among Norwegian College Students. *Contemporary Educational Psychology*, 23 (2), 182-194.
- Buytendijk, J. J. F. (1987). The Phenomenological Approach to the Problem of Feelings and Emotions. In J. J. Kockelmans (Ed.), *Phenomenological Psychology* (pp. 119-132). Dordrecht, Netherlands: Martinus Nijhoff Publishers.
- Carlson, R. E. (1995). Evaluating the Credibility of Sources: A Missing Link in the Teaching of Critical Thinking. *Teaching of Psychology*, 22 (1), 39-41.
- Chamot, U. A. (1993). Student Responses to Learning Strategy Instruction in the Foreign Language Classroom. *Foreign Language Annuals*, 26 (3), 308-321.
- Churchill, D. S.; Lowery, E. J.; McNally, O. & Rao, A. (1998). The Question of Reliability in Interpretive Psychological Research. In R. Valle (Ed.), *Phenomenological Inquiry in Psychology. Existential and Transpersonal Dimensions* (pp. 63-86). New York: Plenum Press.
- Cloonan, F. T. (1995). The Early History of Phenomenological Psychological Research in America. *Journal of Phenomenological Psychology*, 26 (1), 46-126.
- Cooper, P. & McIntyre, D. (1993). Commonality in Teachers' and Pupils' Perceptions of Effective Classroom Learning. *The British Journal of Educational Psychology*, 63 (3), 381-399.
- Costa, L. A. (1992). An Environment for Thinking. In C. Collins & J. N. Mangieri (Eds.) *Teaching Thinking: An Agenda for the Twenty-first Century* (pp. 169-181). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Davidson-Shivers, V. G.; Rasmussen, L. K. & Bratton-Jeffery, F. M. (1997). Investigating Learning Strategies Generation in a Hypermedia Environment Using Qualitative Methods. *Journal of Computing in Childhood Education*, 8 (2/3), 247-261.
- Davies, P. (2000). Differentiation: Processing and Understanding in Teachers' Thinking and Practice. *Educational Studies*, 26 (2), 191-203.
- Day, P. V. & Elksnin, K. L. (1994). Promoting Strategic Learning: Learning Strategies Can Supply the Approaches and Techniques Students Need to Become Successful and Independent Learners. *Intervention in School and Clinic*. 29 (5), 262-270.
- de Ruyter, J. D. (1995). Keeping a Grip on the Grid: A response to Barbara J. Thayer-Bacon. *Philosophy of Education* <http://www.ed.uiuc.edu/EPS/PES-Yearbook/95_docs/deruyter.html>.
- Deichman-Sørensen, T.; Blichfeldt, F. J. & Lauvdal, T. (1997). Kunnskap, Kvalitet, Kontroll:

- Kampen om Opplæringsboka. I B. Lødding & K. Tornes (Red.) *Idealer og Paradokser. Aspekter ved Gjennomføringen av Reform 94* (s. 122-148). Oslo: Tano Aschehoug.
- Deming, P. M.; Valeri-Gold, M. & Idleman, S. L. (1994). The Reliability and Validity of the Learning and Study Strategies Inventory (LASSI) with College Developmental Students. *Reading Research and Instruction, 33* (4), 309-318.
- Derry, J. S. (1990). Learning Strategies for Acquiring Useful Knowledge. In B. F. Jones & L. Idol (Eds.), *Dimensions of Thinking and Cognitive Instruction* (pp. 347-379). Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc.
- Derry, S. J. (1992). Beyond Symbolic Processing: Expanding Horizons for Educational Psychology. *Journal of Educational Psychology, 84*(4), 413-418.
- Du Bois, F. N. & Staley, K. R. (1997). A Self-Regulated Learning Approach to Teaching Educational Psychology. *Educational Psychology Review, 9* (2), 171-197.
- Duffy, G. G. (1993). Teachers' Progress toward Becoming Expert Strategy Teachers. *The Elementary School Journal, 94* (2), 109-120.
- Edmondson, M. K. & Novak, D. J. (1993). The Interplay of Scientific Epistemological Views, Learning Strategies, and Attitudes of College Students. *Journal of Research in Science Teaching, 30* (6), 547-559.
- Edmunds, L. A. (1999). Cognitive Credit Cards: Acquiring Learning Strategies. *Teaching Exceptional Children, 31* (4), 68-73.
- Eklund-Myrskog, G. (1997). Students' Views of Learning in Vocational Education. *Scandinavian Journal of Educational Research, 41* (2), 179-188.
- Elen, J. & Lowyck, J. (2000). Instructional Metacognitive Knowledge: A Qualitative Study on Conceptions of Freshmen about Instruction. *Journal of Curriculum Studies, 32* (3), 421-444.
- Elliott, R.; Fischer, T. C. & Rennie, L. D. (1999). Evolving Guidelines for Publication of Qualitative Research Studies in Psychology and Related Fields. *British Journal of Clinical Psychology, 38*, 215-229.
- Ely, M. C. (1994). Preparing Second Language Teachers for Strategy Instruction: An Integrated Approach. *Foreign Language Annals, 27* (3), 335-342.
- Ennis, H. R. (1992). The Degree to Which Critical Thinking Is Subject Specific: Clarification and Needed Research. In S. P. Norris (Ed.) *The Generalizability of Critical Thinking* (pp. 21-37). New York: Teachers College Press.
- Ertmer, A. P. & Newby, J. T. (1996). The Expert Learner: Strategic, Self-regulated, and Reflective. *Instructional Science, 24*, 1-24.
- Fenomenologi, Fenomenografi och Hermeneutik (1998a). Forum för Humanvitenskaplig Forskning, pp. 20-28. Örelro, Sweden: Högskolen i Örelro.
- Fenomenologi, Fenomenografi och Hermeneutik (1998b). Forum för Humanvitenskaplig Forskning, pp. 3-11. Örelro, Sweden: Högskolen i Örelro.
- Fleming, F. & Walls, G. (1998). What Pupils Do: The Role of Strategic Planning in Modern Foreign Language Learning. *Language Learning Journal, 18* (18), 14-21.
- Folkestad, A. (1997, January 17). *Utdanningspolitikken på Villspor*. <<http://tux1.aftenposten.no/bakgr/970117/kronikk.htm>>
- Frisby, L. C. (1991). A Meta-Analytic Investigation of the Relationship Between Grade Level and Mean Scores on Cornell Critical Thinking Test. *Measurement and Evaluation In Counseling and Development, 23*(4), 162-170.

- Garcia, T. & Pintrich, R. P. (1996). Assessing Students' Motivation and Learning Strategies in the Classroom Context: The Motivated Strategies for Learning Questionnaire. In M. Birenbaum & F. J. R. C. Dochy (Eds.), *Alternatives in Assessment of Achievements, Learning Processes and Prior Knowledge* (pp. 319-339). Boston: Kluwer Academic Publishers.
- Giorgi, A. (1971a). A Phenomenological Approach to the Problem of Meaning and Serial Learning. In A. Giorgi, W. F. Fischer & R. von Eckartsberg (Eds.), *Duquesne Studies in Phenomenological Psychology: Volume I* (pp. 88-100). Pittsburgh, PA: Duquesne University Press.
- Giorgi, A. (1971b). The Experience of the Subject as a Source of Data In a Psychological Experiment. In A. Giorgi, W. F. Fischer & R. von Eckartsberg (Eds.), *Duquesne Studies in Phenomenological Psychology: Volume I* (pp. 50-57). Pittsburgh, P.A.: Duquesne University Press.
- Giorgi, A. (1971c). Phenomenology and Experimental Psychology: II. In A. Giorgi, W. F. Fischer & R. von Eckartsberg (Eds.), *Duquesne Studies in Phenomenological Psychology: Volume I* (pp. 17-29). Pittsburgh, P.A.: Duquesne University Press.
- Giorgi, A. (1975). Convergence and Divergence of Qualitative and Quantitative Methods in Psychology. In A. Giorgi, C. T. Fischer & E. L. Murray (Eds.), *Duquesne Studies in Phenomenological Psychology: Volume II* (pp. 72-79). Pittsburgh, P.A.: Duquesne University Press.
- Giorgi, A. (1982). Issues Relating to the Meaning of Psychology as a Science. In G. Floistad (Ed.), *Contemporary Philosophy. A New Survey* (Vol. 2) (pp. 317-342). The Hague: Martinus Nijhoff.
- Giorgi, A. (1983). Concerning the Possibility of Phenomenological Psychological Research. *Journal of Phenomenological Psychology, 12*, 129-169.
- Giorgi, A. (1985a). Sketch of a Psychological Phenomenological Method. In A. Giorgi (Ed.) *Phenomenology and Psychological Research* (pp. 8-22). Pittsburgh: Duquesne University Press.
- Giorgi, A. (1985b). Toward the Articulation of Psychology as a Coherent Discipline. In S. Koch & D. E. Leary (Eds.), *A Century of Psychology As a Science* (pp. 46-59). New York: McGraw-Hill.
- Giorgi, A. (1985c). The Phenomenological Psychology of Learning and the Verbal Learning Tradition. In A. Giorgi (Ed.), *Phenomenology and Psychological Research* (pp. 23-85). Pittsburgh, PA: Duquesne University Press.
- Giorgi, A. (1986a). The "Context of Discovery/Context of Verification" Distinction and Descriptive Human Science. *Journal of Phenomenological Psychology, 17* (2), 151-166.
- Giorgi, A. (1986b). The Meaning of Psychology from a Scientific Phenomenological Perspective. *Études Phénoménologiques, II* (4), 47-73.
- Giorgi, A. (1986c). Theoretical Justification for the Use of Descriptions in Psychological Research. In P. Ashworth, A. Giorgi & A. de Koning (Eds.), *Qualitative Research in Psychology* (pp. 3-22). Pittsburgh, PA: Duquesne University Press.
- Giorgi, A. (1988). Validity and Reliability from a Phenomenological Perspective. In W. J. Baker, L. P. Mos, H. V. Rappard & H. J. Stam (Eds.), *Recent Trends in Theoretical Psychology* (pp. 167-176). New York: Springer-Verlag.
- Giorgi, A. (1989a). Some Theoretical and Practical Issues Regarding the Psychological Phenomenological Method. *Saybrook Review, 7* (2), 71-85.

- Giorgi, A. (1989b). One Type of Analysis of Descriptive Data: Procedures Involved in Following a Scientific Phenomenological Method. *Methods*, 1 (3), 39-61.
- Giorgi, A. (1989c). Learning and Memory from the Perspective of Phenomenological Psychology. In R. S. Valle & S. Halling (Eds.), *Existential-Phenomenological Perspectives in Psychology* (pp. 99-112). New York: Plenum Press.
- Giorgi, A. (1992). Description versus Interpretation: Competing Alternative Strategies for Qualitative Research. *Journal of Phenomenological Psychology*, 23 (2), 119-135.
- Giorgi, A. (1993). Psychology as the Science of the Paralogical. *Journal of Phenomenological Psychology*, 24, 63-77.
- Giorgi, A. (1994). A Phenomenological Perspective on Certain Qualitative Research Methods. *Journal of Phenomenological Psychology*, 25 (2), 190-220.
- Giorgi, A. (1995). Phenomenological Psychology. In J. A. Smith, R. Harré & L. V. Langenhove (Eds.), *Rethinking Psychology* (pp. 24-42). London: Sage Publications.
- Giorgi, A. (1997). The Theory, Practice, and Evaluation of the Phenomenological Method as a Qualitative Research Procedure. *Journal of Phenomenological Psychology*, 28 (2), 235-260.
- Giorgi, A. (1998, Autumn Semester). Notes taken from the Dr. Polit. seminar with A. Giorgi titled "Theory and Practice of The Phenomenological Method" conducted at the faculty of Psychology, NTNU.
- Giorgi, A. (1999a). A Phenomenological Perspective on Some Phenomenographic Results on Learning. *Journal of Phenomenological Psychology*, 30 (2), 68-93.
- Giorgi, A. (1999b). Personal correspondence. Comments by Giorgi on an unpublished paper.
- Giorgi, A. (2000a). Psychology as a Human Science Revisited. *Journal of Humanistic Psychology*, 40 (3), 56-73.
- Giorgi, A. (2000b). Concerning the Application of Phenomenology to Caring Research. *Scandinavian Journal of Caring Science*, 12, 11-15.
- Giorgi, A. (2000c). The Status of Husserlian Phenomenology in Caring Research. *Scandinavian Journal of Caring Science*, 14, 3-10.
- Gough, S. & Scott, W. (2000). Exploring the Purposes of Qualitative Data Coding in Educational Enquiry: Insights from Recent Research. *Educational Studies*, 26 (3), 339-354.
- Gourgey, F. A. & Earisman, L. D. (1997). Getting Students to Think about Their Own Thinking in an Integrated Verbal-Mathematics Course. *Research and Training in Developmental Education*, 14 (1), 49-56.
- Halpern, F. D. & Nummedal, G. S. (1995). Closing Thoughts about Helping Students Improve how They Think. *Teaching of Psychology*, 22 (1), 82-83.
- Halpern, F. D. (1996). *Thought and Knowledge: An Introduction to Critical Thinking* (3rd ed). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Halpern, F. D. (1998). Teaching Critical Thinking for Transfer Across Domains. Dispositions, Skills, Structure Training, and Metacognitive Monitoring. *American Psychologist* [online] 53 (4), 449-455.
- Hamman, D.; Berthelot, J.; Saia, J. & Crowley, E. (2000). Teachers' Coaching of Learning and Its Relation to Students' Strategic Learning. *Journal of Educational Psychology*, 92 (2), 342-348.
- Hattie, J.; Biggs, J. & Purdie, N. (1996). Effects of Learning Skills Interventions on Student Learning: A Meta-Analysis. *Review of Educational Research*, 66 (2), 99-136.

- Hill, M. (1991). Writing Summaries Promotes Thinking and Learning across the Curriculum-But Why Are They So Difficult to Write? *Journal of Reading*, 34 (7), 536-539.
- Hostetler, K. (1993). In Praise of Passivity in Teaching: An Essay on Life in Classrooms. *Journal of Instructional Psychology*, 20 (1), 40-48.
- Interview with Student Ombudsman (2001, March 14).
- Jansen, D. J. (1995). Effective Schools? *Comparative Education*, 31 (2), 181-200.
- Johnson, H. R. (1992). The Problem of Defining Critical Thinking. In S. P. Norris (Ed.) *The Generalizability of Critical Thinking* (pp. 38-53). New York: Teachers College Press.
- Jonassen, H. D.; Grabinger, S. R. & Harris, C. D. N. (1991). Analyzing and Selecting Instructional Strategies and Tactics. *Performance Improvement Quarterly*, 4 (2), 77-97.
- Kaplan, J. E. & Kies A. D. (1995). Fostering Critical Thinking in the Middle School by Using A Quality Circle Strategy. *Journal of Instructional Psychology*, 22 (2), 186-189.
- Karabenick, A. S. & Sharma, R. (1994). Perceived Teacher Support of Student Questioning in the College Classroom: Its Relation to Student Characteristics and Role in the Classroom Questioning Process. *Journal of Educational Psychology*, 86 (1), 90-103.
- Karlsson, G. (1993). *Psychological Qualitative Research from a Phenomenological Perspective*. Stockholm: Almqvist & Wiksell.
- Katsimanis, S. & Roussos, N. E. (1986). *Philosophia – 3 Lykeiou (Philosophy for the 3rd class of Lyceum)*. Athens: OEDB.
- Kennedy, M.; Fisher, B. M. & Ennis, H. R. (1991). Critical Thinking: Literature Review and Needed Research. In L. Idol & B. F. Jones (Eds.) *Educational Values and Cognitive Instruction: Implications for Reform* (pp. 11-40). Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Kincheloe, L. J. (2000). Making Critical Thinking Critical. In D. Weil & H. K. Anderson (Eds.) *Perspectives in Critical Thinking. Essays by Teachers in Theory and Practice* (pp. 23-40). New York: Peter Lang.
- Klein, F. M. (1990). Approaches to Curriculum Theory and Practice. In J. T. Sears & J. D. Marshall (Eds.) *Teaching and Thinking About Curriculum. Critical Inquires* (pp. 3-14). New York: Teachers College Press.
- Kline, M. F.; Deshler, D. D. & Schumaker, B. J. (1992). Implementing Learning Strategy Instruction in Class Settings: A Research Perspective. In M. Pressley, K. R. Harris & J. T. Guthrie (Eds.), *Promoting Academic Competence and Literacy in School* (pp. 361-406). San Diego, California: Academic Press.
- Knight, J. (1993). Learning Strategies Go to College. *Preventing School Failure*, 38 (1), 36-42.
- Kockelmans, J. J. (1973). Theoretical Problems in Phenomenological Psychology. In M. Natanson (Ed.) *Phenomenology and The Social Sciences. Volume 1* (pp. 225-280). Evanston: Northwest University Press.
- Kraft, P. N. (2000). The Role of Service-Learning in Critical Thinking. In D. Weil & H. K. Anderson (Eds.) *Perspectives in Critical Thinking. Essays by Teachers in Theory and Practice* (pp. 75-94). New York: Peter Lang.
- KUF (1994). *Education*.
- KUF (1997). *Nytt om Reform 94. Metodiske veiledninger*.
<<http://odin.dep.no/odinarkiv/norsk/dep/kuf/1997/publ/014005-990956/index-dok000-b-n-a.html>>
- KUF (1997-98). *The Competence Reform Report No. 42 to the Storting (Abridged version)*.
<<http://odin.dep.no/kuf/norsk/publ/stmeld/014005-040016/index-dok000-b-n-a.html>>

- KUF (1999, October 12). *Tildelingsbrev Del 1. Oppgaver for statens utdanningskontorer*.
<<http://odin.dep.no/kuf/norsk/publ/veiledninger/014005-994009/index-dok000-b-n-a.html>>
- Kuhn, D. (1999). A Developmental Model of Critical Thinking. *Educational Researcher*, 28 (2), 16-25.
- Loranger, L. A. (1994). The Study Strategies of Successful and Unsuccessful High School Students. *Journal of Reading Behavior*, 26 (4), 347-360.
- Lyotard, J. F. (1991). *Phenomenology*. Albany: State University of New York Press.
- Martin, R. J. (1992). Critical Thinking for a Humane World. In S. P. Norris (Ed.) *The Generalizability of Critical Thinking* (pp. 163-180). New York: Teachers College Press.
- Mayer, E. R. (1996). Learning Strategies for Making Sense out of Expository Text: The SOI Model for Guiding Three Cognitive Processes in Knowledge Construction. *Educational Psychology Review*, 8 (4), 357-371.
- Mayo, E. K. (1993). Learning Strategy Instruction: Exploring the Potential of Metacognition. *Reading Improvement*, 30 (3), 130-133.
- McDonough, M. F. (1998). An Assessment of Critical Thinking at the Community College Level. *Dissertation Abstracts International, Section A: Humanities and Social Sciences*, 58 (7-A), 2561.
- McGrane, A. P. & Sternberg, J. R. (1992). Discussion: Fatal Vision - The Failure of the Schools in Teaching Children to Think. In C. Collins & J. N. Mangieri (Eds.) *Teaching Thinking: An Agenda for the Twenty-First Century* (pp. 333-344). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- McIntosh, D. (1997). Husserl, Weber, Freud, and the Method of the Human Sciences. *Philosophy of the Social Sciences*, 27 (3), 328-353.
- McPeck, E. J. (1990a). Three Competing Conceptions of Critical Thinking. In J. E. McPeck (Ed.) *Teaching Critical Thinking: Dialogue and Dialectic* (pp. 19-33). New York: Routledge.
- McPeck, E. J. (1990b). Some Practical Guidelines for Teaching Critical Thinking. In J. E. McPeck (Ed.) *Teaching Critical Thinking: Dialogue and Dialectic* (pp. 48-53). New York: Routledge.
- Meltzer, J., L. (1993). Strategy Use in Students with Learning Disabilities: The Challenge of Assessment. In L. J. Meltzer (Ed.) *Strategy Assessment and Instruction for Students with Learning Disabilities: From Theory to Practice*. (pp. 93-139). Austin: Pro-ed Inc.
- Monsen, L. (1996a). Kan Vi Målstyre Læreplanreformer? I J. F. Blichfeldt (Red.) *Utdanning for Alle? Evaluering av Reform 94* (s. 262-296). Oslo: Tano Aschehoug.
- Monsen, L. (1996b). En analyse av Reform -94. I P. Haug (Red.) *Pedagogikk i ei Reformtid: Foredrag på den 4. nasjonale Fagkonferansen i Pedagogikk (1995)* (s. 79-90). Volda: Høgskulen i Volda.
- Monsen, L. (1997) "Ansvar for Egen Læring" – Fra Slagord til Klasserom. I B. Lødding & K. Tornes (Red.) *Idealer og Paradokser. Aspekter ved Gjennomføringen av Reform 94* (ss. 31-67). Oslo: Tano Aschehoug
- Monsen, L. (1998). *Evalueringen av Reform 94. Sluttrapport. Innholdsreformen – fra Måldokument til Klasserompraksis. Forskningsrapport nr. 42/1998*. Lillehammer: Høgskolen i Lillehammer.
- Monsen, L. (1999). Reform 94 som Læreplanreform – mot Nye Elev- og Læreroller? I R. Kvalsund; T. Deichman-Sørensen & P. O. Aamodt (Red.) *Videregående Opplæring – ved*

- en Skilleveg? Forskning fra den Nasjonale Evalueringen av Reform 94* (s. 77-100). Oslo: Tano Aschehoug.
- Morseth Herzberg, D. (1998, høst). *Utdanningspolitikk i den Postmoderne Tilstand. En Analyse av Utdanningspolitikk og Sosialiseringvilkår*. Hovedfagsoppgave i Pedagogikk. Pedagogisk Institutt, NTNU.
- Nasjonalt Læremiddelsenter (1994a). *Core Curriculum for Primary, Secondary and Adult Education in Norway*.
- Nasjonalt Læremiddelsenter (1994b). *Veiviseren*.
- Natanson, M. (1973). Phenomenology and the Social Sciences. In M. Natanson (Ed.) *Phenomenology and The Social Sciences. Volume 1* (pp. 3-44). Evanston: Northwest University Press.
- Newmann, M. F. (1992). The Prospects for Classroom Thoughtfulness in High School Social Studies. In C. Collins & J. N. Mangieri (Eds.) *Teaching Thinking: An Agenda for the Twenty-first Century* (pp. 105-132). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Nolen, B. S. (1996). Why Study? How Reasons for Learning Influence Strategy Selection. *Educational Psychology Review*, 8 (4), 335-355.
- Norris, P. S. (1990). Thinking about Critical Thinking: Philosophers Can't Go It Alone. In J. E. McPeck (Ed.) *Teaching Critical Thinking: Dialogue and Dialectic* (pp. 67-74). New York: Routledge.
- Nyikos, M. & Oxford, R. (1993). A Factor Analytic Study of Language-Learning Strategy Use: Interpretations from Information-Processing Theory and Social Psychology. *The Modern Language Journal*, 77(1), 11-22.
- ODIN (1996a). *Videregående Opplæring etter Reform 94*.
<<http://odin.dep.no/kuf/norsk/publ/veiledninger/014005-991150/index-dok000-b-n-a.html>>
- ODIN (1996b). *Upper Secondary Education in Norway after the Introduction of Reform '94*.
<<http://odin.dep.no/kuf/publ/ref94-en.html>>
- Odinarkiv (1998). *Tilstandsrapport for Året 1997/98*.
<<http://odin.dep.no/odinarkiv/norsk/dep/kuf/1998/publ/014005-990339/index-hov003-b-n-a.html>>
- Olaussen, S. B. & Bråten, I. (1999). Students' Use of Strategies for Self-regulated Learning: Cross-cultural Perspectives. *Scandinavian Journal of Educational Research*, 43 (4), 409-432.
- Olsen, G. D. (1995). "Less" Can Be "More" in the Promotion of Thinking. *Social Education*, 59 (3), 130-134.
- Ornstein, C. A. (1994). Homework, Studying, and Note Taking: Essential Skills for Students. *NASSP Bulletin*, 78 (558), 58-70.
- Oxford, L. R. (1996). Employing a Questionnaire to Assess the Use of Language Learning Strategies. *Applied Language Learning*, 7 (1-2), 25-45.
- Paul, R. (1990). McPeck's Mistakes. In J. E. McPeck (Ed.) *Teaching Critical Thinking: Dialogue and Dialectic* (pp. 102-111). New York: Routledge.
- Pink, T. W. (1990). Implementing Curriculum Inquiry. In J. T. Sears & J. D. Marshall (Eds.) *Teaching and Thinking About Curriculum. Critical Inquires* (pp. 138-153). New York: Teachers College Press.

- Pintrich, P. R. & De Groot, E. (1990). Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology*, 82, 33-40.
- Polkinghorne, E. D. (1986a). Conceptual Validity in a Nontheoretical Human Science. *Journal of Phenomenological Psychology*, 17 (2), 129-149.
- Polkinghorne, E. D. (1986b). Changing Conversation about Human Science. *Saybrook Review*, 6 (1), 1-32.
- Porras, D. (1994). Do Your Students Digest Mathematics Like Ice Cream or Like Steak? *Mathematics and Computer Education*, 28 (1), 6-15.
- Pressley, M.; Borowski, G. J.; Forrest-Pressely, D.; Gaskins, W. I. & Wile, D. (1993). Closing Thoughts on Strategy Instruction for Individuals with Learning Disabilities: The Good-Information-Processing Perspective. In L. J. Meltzer (Ed.), *Strategy Assessment and Instruction for Students with Learning Disabilities. From Theory to Practice* (pp. 355-377). Austin, Texas: Pro-ed.
- Pressley, M.; Harris, K. R. & Marks, M. B. (1992). But Good Strategy Instructor Are Constructivists! *Educational Psychology Review*, 4(1), 3-31.
- Pressley, M.; Yokoi, L. ; van Meter, P.; Van Etten, S. & Freebern, G. (1997). Some of the Reasons Why Preparing for Exams Is So Hard: What Can Be Done to Make It Easier? *Educational Psychology Review*, 9 (1), 1-38.
- Quicke, J. (1994). Metacognition, Pupil Empowerment and the School Context. *School Psychology International*, 15, 247-260.
- Rabren, K. & Darch, C. (1996). The Strategic Comprehension Behavior of Students with Learning Disabilities and General Education Students: Teachers' and Students' Perspectives. *Journal of Research and Development in Education*, 29 (3), 172-180.
- Rahilly, A., D. (1993). A Phenomenological Analysis of Authentic Experience. *Journal of Humanistic Psychology*, 33(2), 49-71.
- Rahimi, A. (1995). *Problem-Based and Conventional Medical Education from a Student Perspective: A Qualitative Analysis Comparing Students' Experience of Medical Education, Approach to Learning and Reading Comprehension*. No. 45. Linköping: Universitetet, 1995.
- Reid, J. D. & Johnston, M. (1999). Improving Teaching in Higher Education: Student and Teacher Perspectives. *Educational Studies*, 25 (3), 269-281.
- Salner, M. (1986). Validity in Human Science Research. *Saybrook Review*, 6 (1), 107-130.
- Sand, S. (2000, October, 23). *Reform 94 Får Stryk Igjen*.
<<http://www.adressa.no/forbruker/skole/article.jhtml?articleID=117652>>
- Sarris, G. (2000). Storytelling in the Classroom: Crossing Vexed Chasms. In D. Weil & H. K. Anderson (Eds.) *Perspectives in Critical Thinking. Essays by Teachers in Theory and Practice* (pp. 57-74). New York: Peter Lang.
- Sawyer, J. R.; Graham, S. & Harris, R. K. (1992). Direct Teaching, Strategy Instruction, and Strategy Instruction With Explicit Self-Regulation: Effects on the Composition Skills and Self-efficacy of Students With Learning Disabilities. *Journal of Educational Psychology*, 84 (3), 340-352.
- Schraw, G. (1998). Promoting General Metacognitive Awareness. *Instructional Science*. 26 (1-2), 113-125.
- Schunk, H. D. (1991). *Learning Theories: An Educational Perspective*. New York, NY, England: Macmillan Publishing Company.
- Schutz, A. P.; Drogosz, M. L.; White, E. V. & Distefano, C. (1998). Prior Knowledge, Attitude,

- and Strategy Use in an Introduction to Statistics Course. *Learning and Individual Differences*, 10 (4), 291-308.
- Shapiro, J. K. (1986). Verification: Validity or Understanding. *Journal of Phenomenological Psychology*, 17 (2), 167-177.
- Siegel, H. (1988). *Educating Reason. Rationality, Critical Thinking and Education*. New York: Routledge, Inc.
- Siegel, H. (1990). McPeck, Informal Logic, and the Nature of Critical Thinking. In J. E. McPeck (Ed.) *Teaching Critical Thinking: Dialogue and Dialectic* (pp. 75-85). New York: Routledge.
- Siegel, H. (1992). The Generalizability of critical Thinking Skills, Dispositions, and Epistemology. In S. P. Norris (Ed.) *The Generalizability of Critical Thinking* (pp. 97-108). New York: Teachers College Press.
- Sinclair, A. (1994). Prediction Making as an Instructional Strategy: Implications of Teacher Effects on Learning, Attitude toward Science, and Classroom Participation. *The Journal of Research and Development in Education*, 27 (3), 153-161.
- Skarpenes, O. (1998, March 13). *Kunnskapssyn og Politikk*.
<<http://www.dagbladet.no/kultur/1998/03/13/69239.htm>>
- Spiegelberg, H. (1975). *Doing Phenomenology. Essays on and in Phenomenology*. The Hague: Martinus Nijhoff.
- Spinelli, E. (1989). *The Interpreted World. An Introduction to Phenomenological Psychology*. London: Sage Publications.
- St. meld. nr. 32 (1998-99). *Videregående Opplæring*.
<<http://odin.dep.no/kuf/norsk/publ/stmeld/014005-040024/index-dok000-b-n-a.html>>
- Sullivan-Palinscar, A.; Winn, J.; David, Y.; Snyder, B. & Stevens, D. (1993). Approaches to Strategic Reading Instruction Reflecting Different Assumptions Regarding Teaching and Learning. In L. J. Meltzer (Ed.), *Strategy Assessment and Instruction for Students with Learning Disabilities. From Theory to Practice* (pp. 247-270). Austin, Texas: Pro-ed.
- Swanson, L. H. (1993). Principles and Procedures in Strategy Use. In L. J. Meltzer (Ed.), *Strategy Assessment and Instruction for Students with Learning Disabilities. From Theory to Practice* (pp. 61-92). Austin, Texas: Pro-ed.
- Säljö, R. (1986). The Man-Made World of Learning: Remarks on the Potential Value of a Descriptive Tradition in Pedagogic Research. In P. Ashworth, A. Giorgi & A. J. J. de Koning (Eds.), *Qualitative Research in Psychology* (pp. 117-128). Pittsburgh, PA: Duquesne University Press.
- Tabulawa, R. (1998). Teachers' Perspectives on Classroom Practice in Botswana: Implications for Pedagogical Change. *Qualitative Studies in Education*, 11 (2), 249-268.
- Telhaug, O. A. (1997). *Utdanningsreformene: Oversikt og Analyse*. Oslo: Didakta Norsk Forlag.
- Thayer-Bacon, J. B. (1995). Navigating Epistemological Territories. *The Philosophy of Education Society*. <http://www.ed.uiuc.edu/EPS/PES-Yearbook/95_docs/thayerbacon.html>
- Thayer-Bacon, J. B. (2000). *Transforming Critical Thinking. Thinking Constructively*. New York: Teachers College Press.
- Turnure, E., J. (1987) Social Influences on Cognitive Strategies and Cognitive Development: The Role of Communication and Instruction. *Intelligence*, 11, 77-89.
- Udall, J. A. & High, H. M. (1989). What Are They Thinking When We're Teaching Critical Thinking? *The Gifted Child Quarterly*, 33 (4), 156-160.

- Unge Alvorlige Syke av Skolereform (2000, June 27).
 <<http://www.adressa.no/nyheter/article.jhtml?articleID=73328>>
- Vann, J. R. & Abraham, G. R. (1990). Strategies of Unsuccessful Language Learners. *TESOL Quarterly*, 24 (2), 177-198.
- Vaughn, S.; Schumm, S. J.; Klingner, J. & Saumell, L. (1995). Students' Views of Instructional Practices: Implications for Inclusion. *Learning Disability Quarterly*, 18 (3), 236-248.
- Vizcarro, C.; Bermejo, I.; Del Castillo, M. & Aragonés, C. (1996). Development of an Inventory to Measure Learning Strategies. In M. Birenbaum & F. J. R. C. Dochy (Eds.), *Alternatives in Assessment of Achievements, Learning Processes and Prior Knowledge* (pp. 341-364). Boston: Kluwer Academic Publishers.
- von Eckartsberg, R. (1998a). Introducing Existential-Phenomenological Psychology. In R. Valle (Ed.), *Phenomenological Inquiry in Psychology. Existential and Transpersonal Dimensions* (pp. 3-20). New York: Plenum Press.
- von Eckartsberg, R. (1998b). Existential-Phenomenological Research. In R. Valle (Ed.), *Phenomenological Inquiry in Psychology. Existential and Transpersonal Dimensions* (pp. 21-62). New York: Plenum Press.
- von Knorring-Giorgi, B. (1998). *A Phenomenological Analysis of the Experience of Pivotal Moments in Therapy as Defined by Clients. Thesis Presented as a Partial Fulfillment for the Degree of Doctor of Philosophy in Psychology*. Quebec, Montreal: Universite du Quebec a Montreal.
- Walsh, C. M. & Hardy, R. C. (1997). Factor Structure Stability of the California Critical Thinking Disposition Inventory across Sex and Various Students' Majors. *Perceptual and Motor Skills*, 85 (3), 1211-1228.
- Weinert, F. R. & Kluwe, R. (1987). *Metacognition, Motivation and Performance*. Hillsdale: Lawrence Erlbaum Associates.
- Weinstein, E. C. & MacDonald, D. J. (1986). Why Does a School Psychologist Need to Know about Learning Strategies? *Journal of School Psychology*, 24 (3), 257-265.
- Weinstein, E. C. (1988). Assessment and Training of Student Learning Strategies. In R. R. Schmeck (Ed.) *Learning Strategies and Learning Styles* (pp. 291-316). New York: Plenum Press.
- Weinstein, E. C. & Underwood, L. V. (1985). Learning Strategies: The How of Learning. In J. W. Segal, S. F. Chipman & R. Glaser (Eds.), *Thinking and Learning Skills. Volume 1: Relating Instruction to Research* (pp. 241-258). Hillsdale: Lawrence Erlbaum Associates, Inc.
- Welch-Marks, J.; Van Laeys, J.; Bender, N. W. & Scott, S. K. (1996). Teachers Create Learning Strategies: Guidelines for Classroom Creation. *Teaching Exceptional Children*, 28 (4), 34-38.
- Wertz, J. F. & Aanstoos, C. (1999). Amedeo Giorgi and the Project of a Human Science. In D. Moss (Ed.), *Humanistic and Transpersonal Psychology: A Historical and Biographical Sourcebook* (pp. 287-300). Westport, C. T.: Greenwood Press.
- Wertz, J. F. (1986). The Question of the Reliability of Psychological Research. *Journal of Phenomenological Psychology*, 17 (2), 181-205.
- Young, D. J. (1996). The Effect of Self-Regulated Learning Strategies on Performance in Learner Controlled Computer-Based Instruction. *Educational Technology Research & Development*, 44 (2), 17-27.

- Zimmerman, J. B. & Martinez-Pons, M. (1988). Construct Validation of A Strategy Model of Student Self-Regulated Learning. *Journal of Educational Psychology*, 80(3), 284-290.
- Zimmerman, J. B. & Martinez-Pons, M. (1990). Student Differences in Self-Regulated Learning: Relating Grade, Sex, and Giftedness to Self-Efficacy and Strategy Use. *Journal of Educational Psychology*, 82(1), 51-59.
- Zimmerman, J. B. (1996). Enhancing Student Academic and Health Functioning: A Self-Regulatory Perspective. *School Psychology Quarterly*, 11 (1), 47-66.
- Aanstoos, M. C. (1986). Phenomenology and the Psychology of Thinking. In P. Ashworth, A. Giorgi & A. J. J. de Koning (Eds.), *Qualitative Research in Psychology* (pp. 79-116). Pittsburgh, PA: Duquesne University Press.
- Aasen, P. (2000, March 25). *Utdannelsespolitikens Både Og*.
<<http://www.aftenposten.no/meninger/kronikker/d131700.htm>>

APPENDIX

APPENDIX A

RAW DATA AND ANALYSES

SCHOOL 1

PRINCIPAL

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Hva gjør du for å sikre at disse målene er oppnådd her på skolen? R: Det kan være veldig mye. Akkurat nå jobber vi med å innføre ny lederkultur på skolen, fordi at det er viktig for meg at vi har mange ledere som er nærme lærerne, sånn at sannhetens øyeblikk når det gjelder overføring av denne typen kunnskap er det som skjer i møtet mellom elev og lærer eller kanskje mellom elev og elev, og fra den del, men at vi sikrer oss at denne prosessen hos elever at den blir fornuftig i forhold til det som skal læres.</p> <p>2. Da blir det veldig viktig at vi har ledere, det vi kaller avdelingsledere som vi ønsker å innføre, som er veldig nærme læreren og lærerens jobb, og kan snakke mye med læreren og om hvordan han faktisk jobber, hvordan han klarer å gjennomføre det som står i læreplanen.</p> <p>3. Så det er viktig for oss og spesielt på</p>	<p>1. S states her role includes to ensure that the guidelines of the core curriculum are followed at school. S explains that in order to ensure that the transmission of knowledge between teachers-students and students-students is done in an effective way, the teachers should have a close communication with the administration.</p> <p>2. S stresses the significance of the establishment of a close contact between certain persons (called department-leaders) and the teachers. Their role is to discuss the teachers' work with them, namely the means and methods used so as to apply the guidelines of the core curriculum.</p> <p>3. S states that in order to apply the guidelines</p>	<p>1-2 S indicates that in order to ensure that the core curriculum guidelines are applied at school, they have appointed certain leaders who are in close contact with the teachers. Their responsibility is to discuss the exact way the application of these goals takes place.</p> <p>3-4 S acknowledges the need to be in</p>

<p>allmennfag (AA) studieretning, hvor det kanskje er...det største problemet i forhold til å gjennomføre den her type trening i tenking som det står her, så er vi spesielt dårlig på det. Det er litt for lang avstand ved rektor ned til den enkelte lærer når det gjelder å følge opp, sikre seg at det her blir gjort på en god måte.</p>	<p>given in relation to training in thinking she needs to be in close contact with the teachers and have insight to their work. S admits that this does not occur when it comes to the general theoretical courses (AA).</p>	<p>personal contact and communication with the teachers so as to have a close overview of their work in relation to the application of the core curriculum guidelines. S admits this is not completely achieved with the teachers of the general theoretical subjects (AA).</p>
<p>4. Ellers så mener jeg jo at det som står i læreplaner er det som skal gjennomføres, og at vi må sikre oss på best mulig måte, og jeg som rektor, jeg må sikre på best mulig måte at det som står i læreplaner faktisk blir gjennomført. Det kan vi gjøre på forskjellige måter, bl.a. ved å snakke med læreren, jeg har faktisk snakket med alle lærerne her på skolen to ganger siden jeg begynte her for to og ett halvt år siden, det var på en måte en sånn startfase, det er noe du gjør til å begynne med.</p>	<p>4. S emphasises that her job is to ensure that the guidelines are followed; this is mainly accomplished by her having personal conversations with each one of the teachers.</p>	
<p>5. Nå i år, har vi latt inspektører og avdelingsledere snakke med lærerne, for det er like viktig at de også kommuniserer med lærerne, at de hører hva lærerne oppfatter som et problem, at de ønsker hjelp og støtte til, og at de klarer det bra på egen hånd. Da bruker vi å spørre om det her med hvordan man gjennomfører opplæringen, er veldig konkret på det, kanskje ber dem om å komme med et eksempel på hva de gjør, altså vi spør læreren om eksempel på hva han gjør i opplæringen for å sikre seg det der.</p>	<p>5. S adds that various people from the administrative level have discussions with the teachers on the latter's positive and negative experiences with the application of the guidelines. These discussions include teachers' presentation of concrete ways on how they apply the guidelines in the classroom.</p>	

<p>6. F: Kunne du gi meg et eksempel kanskje? Når dere snakker med lærerne, får de noen spesifikke instruksjoner om hva de må gjøre, eller snakker dere på en mer generell måte?</p> <p>R: Vi vil i norsk skole, for å si det generelt ikke fortelle læreren eksakt hvordan man skal drive sin opplæring. Det vil vi nok ikke gjøre. Det vil i alle fall ikke jeg gjøre. Fordi at lærere er så forskjellige, de har sin personlighet, de har sine kunnskaper, de har sin erfaring med seg, og de må få lov til å bruke det som dem er god på, du kan si at det er som en fotballspiller; hvis du bruker høyre foten, så er det dumt å sette vedkommende til å spille på venstre sida sånn at...det er viktig for oss altså å la lærere få lov til å bruke sine individuelle ferdigheter til å gjøre undervisningen god. Noen er en god forteller, og kan fortelle og holde elevene i en fortelling, noen er veldig god på andre ting, de kan være flinke til å dramatisere, f. eks. å bruke drama i undervisninga si, mens det ville være en katastrofe for en annen lærer som ikke klarer den oppgaven.</p>	<p>6. S explains that she does not wish to instruct the teachers on how to carry out their job, due to the teachers' individual differences regarding personality characteristics, educational background and experience. S believes that the teachers are capable of using the educational method that allows them to use their full potential.</p>	<p>6-7 S specifies that she disagrees with dictating to the teachers the proper way to carry out the instruction, as this counteracts a successful result. The teachers rather have the freedom to build up the lesson according to their individual characteristics, abilities and preferences. Nevertheless, the school still tries to ensure the application of the core curriculum guidelines, by running a specially designed programme.</p>
<p>7. Når det er sagt, så er det klart at vi sikrer oss for en del i forhold til arbeidsformer og det 'Aktivt Prosjekt' prosjektet som vi driver her på skolen, det vil jo forsøke å sikre på en bedre måte enn å bare bruke læreplanen, at elevene da lærer seg det her med kritisk tenking f.</p>	<p>7. S adds that at the same time that the teachers are given the freedom to build up their lessons in their own way, the school also attempts to ensure that the students are trained in the areas that the core curriculum points out, by running a special programme.</p>	

<p>eks. som du har henvist til her.</p> <p>8. F: Kunne du snakke litt mer om dette 'Aktivt Prosjekt'?</p> <p>R: Ja. 'Aktivt Prosjekt' det er altså da et prosjekt som vi har drevet med her på skolen nå i tre år, tre til fire år, vi startet etter en studiereise til Island. Island har et helt annet skolesystem enn det Norge har, mer rettet i moduler der elevene gjør seg ferdig med fag, mens vi i Norge har det timefag systemet, der elever følger samme faget tre timer i uka f. eks. gjennom ett halvt år. Men det vi har tatt inn i det vi kaller 'Aktivt Prosjekt', det er det her organiseringen i læringsenheter, der vi deler året i seks læringsenheter.</p>	<p>8. S explains that this programme has been running for quite a long time now, and is constructed according to a different educational system where the academic year is divided in various subject-units that are followed for a certain time period, one at a time.</p>	
<p>9. Det som er hensikt med det, er det at i starten på en slik læringsenhet, så ønsker vi at lærerne og elevene skal jobbe sammen om å planlegge det som skal skje i de neste ukene. At de snakker med hverandre, hva som er hensikt med det vi gjør nå, hvordan skal vi gjøre det, altså hva slags læringsmetoder: Skal vi bruke gruppearbeid, prosjektarbeid, skal vi dra ut på en ekskursjon, ønsker de at læreren skal forelese mye fra tavla, hvordan skal det gjøres. Så blir man enig om det - det må jo være sånn at hvis det er uenighet i klassen, så må læreren avgjøre hva han syns er fornuftig, etter å ha hørt på de rådene har får fra elevene.</p> <p>10. Så bruker man da en slik</p>	<p>9. S specifies that in these subject-units the teachers and the students co-operate on planning the lessons, by discussing and agreeing on the learning process (i.e. aims, methods, degree of student participation). In case of disagreement, the teacher has the responsibility to make the final decision, by taking into consideration the students' suggestions.</p>	
<p>10. Så bruker man da en slik</p>	<p>10. S stresses that these subject-units</p>	

<p>læringsperiode - den ønsker vi skal være tverrfaglig, slik at minst to fag er involvert i hele eller deler av den perioden, det bør ikke nødvendigvis være i sammenhengende seks uker, men når to fag i hvert fall har noen fellespunkt i den perioden. Vi ønsker at elevene skal trenes opp i å se at i den virkelige verden så er det ikke fag-delt, vi bruker mange fag samtidig, uansett hvilket yrke du har.</p>	<p>incorporate more than one subject-area. The integration of these subjects is done by following the criterion of common elements, and it aims to prepare the students for the reality met in their future working life.</p>	
<p>11. Så på slutten av en sånn periode, så ønsker vi at elevene og lærerne skal være sammen i noen timer og snakke litt om hva de har gjort, gjerne presentere et eller annet, om det er i veggavisen, om det er et dramainnslag med en film de har laget, eller om bare elevene holder foredrag for resten av klassen. Vi tror nok at elevene lærer veldig mye på det å holde foredrag for andre, vi tror kanskje ikke at de lærer så mye av å høre på at noen holder foredrag. Men det å reise opp, det å holde et foredrag for andre, det tror vi er ganske lærerikt.</p>	<p>11. S says that after the completion of such a subject-unit, the students together with the teachers evaluate the process followed and make a presentation of what they have gone through. This presentation might take various facets, from the traditional lecture to an artistic expression. Its leads to better learning results, as the students actively demonstrate the knowledge gained.</p>	
<p>12. F: Så hva er det sentrale målet med dette 'Aktivt Prosjekt'?</p> <p>R: Altså det sentrale målet er jo da å få med inn det som vi er pålagt å holde på med, det med elevmedvirkning, at elevene deltar i større grad i opplæringa selv, både i planleggingen, i gjennomføringen og i evalueringen. At de ikke sitter som passive mottakere av kunnskap fra en</p>	<p>12. S states that through this specially designed programme the students become active participants in the learning process (i.e. in the planning, execution and evaluation), as they mentally elaborate the various phases and at the end evaluate their own work. This process involves co-operation with others and leads to the elaboration of one's knowledge. S supports this type of training has long-lasting</p>	<p>12. S states that when the students participate actively in the phases of the learning process, they elaborate knowledge and make own judgements about it, also with contribution from others. The student thus develops a long-lasting inquiring attitude regarding his/her future working-life.</p>

<p>lærer, at de ikke blir en båndopptaker som bare skal gjengi det læreren har fortalt dem, ukritisk. Vi tror at når eleven deltar aktivt selv, tenker han litt mer gjennom hvordan det her skal planlegges, hvordan det her skal gjennomføres, så etterpå å ikke bare la læreren evaluere seg, men evaluere seg selv og gruppens arbeid. Da tror vi at elevene blir mer kritisk til valg av metoder også senere. Så eievmedvirkning er veldig viktig,</p>	<p>results concerning the development of an inquiring and examining attitude around working-life matters.</p>	
<p>13. det med å differensiere undervisningen - i den nye opplæringsloven som vi har nå i Norge, så står det der at undervisningen skal tilpasses den enkelte elevs emner og forutsetninger, når det er her 28 elever i en klasse, så er det en utfordring for en lærer å få til det, tilpasse sånn at det passer for alle de 28 elevene.</p>	<p>13. S states that the teachers' work is quite demanding, as the educational law maintains that their instruction must appeal to the individual needs and capacity of the students.</p>	
<p>14. Vi tror at når elevene jobber mer selv, så kan en utnytte de evnene en har i stedet for at han da passivt mottar informasjon i fra læreren. Vi må gjøre det og, vi må ha noen forelesninger og spesielt på AA studieretning så tror jeg at det er helt nødvendig i en del fag å ha det som læreplanen har i dag. Men vi ønsker oss å styrke det der med mere frie arbeidsformer.</p>	<p>14. Even though S believes that active participation in learning tasks contributes to the development of one's capacity, she stresses that when it comes to the general theoretical subjects (AA), the 'traditional' lectures are unavoidable, due to the curriculum guidelines.</p>	
<p>15. Vi tror at når elevene jobber i grupper og vi tror ikke minst at når elevene jobber med prosjektarbeid, så oppstår det en del nye tankerelasjonen til det der som gjør</p>	<p>15. S emphasises that group-work and project-work are essential methods of learning that contribute to the development of the students' thinking process (i.e. being able to make new</p>	<p>15. S explains the students are enabled to become inquisitive to what they learn by connecting extant knowledge in new ways; this is achieved with participation</p>

<p>dem mer kritisk til læring enn det som ville være tilfelle, når de bare passivt tar imot informasjon. Så det med prosjektarbeid, det er jo en del av 'Aktivt Prosjekt' prosjektet, det at de skal lage noe, presentere noe, gjøre noe i løpet av den her perioden, det kan være korte prosjekter på - det kan være en dag på det, det å lage problemstilling, det å finne informasjon selv. Det å samle det, systematisere det, presentere det for de andre, den type aktivitet, det er i og for seg,</p>	<p>connections among the various knowledge-areas), and eventually to them putting their learning under questioning. S explains that this is achieved through the procedure of creating a work-piece by choosing the way of posing the problem, by seeking appropriate information sources and by presenting the final product.</p>	<p>in the planning and execution of a common project, which requires discovery of a problem, seeking of appropriate information sources and presentation of the work.</p>
<p>16. selv om jeg i utgangspunktet sa at læreren var fri til å bruke sine egne evner, forutsetninger, så må man delta i det her arbeidet, det fellesarbeidet, du kan si 'Aktivt Prosjekt' det er så mye der, at det ikke er bare samlebegrep om en rekke pedagogiske ting, det å jobbe i team, det å jobbe sammen med andre lærere, det å snakke med elevene, med klassen og tverrfaglighet, differensiering, det syns jeg er viktig. At ikke læreren i så stor grad som det kanskje var i gamle dager jobbet med sitt eget fag, i sin egen timen, med sine egne elever og snakker egentlig lite med andre om det. Ønsker å oppnå en åpenhet i denne situasjonen.</p>	<p>16. S specifies that even though the teachers have the freedom to build up the lessons in their own way, they should also be able to work harmoniously with the students and the other teachers. S finds this co-operation essential, as discussing and getting other perspectives on the learning process is very beneficial.</p>	
<p>17. F: Men er det alle elevene som deltar i 'Aktivt Prosjekt'? R: Nei. Nå er det, i år er det våre sju grunnskurs, og det er en klasse på VKI</p>	<p>17. S explains that the students that participate in this specially designed programme are mostly the ones belonging to the foundation courses and to subjects with a practical orientation.</p>	

<p>formgivning (FO). Neste år vil det være også VK kurs musikk, dans og drama, også VKII FO. Så neste år, så blir det da 11 klasser. Da blir det halve skolen. F: Hva med AA? R: Bare grunnkurs AA som er med i. Grunnkurs AA er også med i år. Det er første gang dem har vært med i år,</p>		
<p>18. og det er klart, vi har en god del problemer med å gjennomføre det her i praksis, det jeg sier nå, på grunnkurs allmennfag det er mange problemer forbundet med det her arbeidet. Sånn at vi ønsker å bruke ett år til på å prøve å lære litt mer om hvordan vi skal få til dette her. Fordi at lærerne syns ofte at det her er vanskelig, det krever mye arbeid, krever mye forberedelse til å jobbe sammen med andre osv. Det kan være nye ting.</p>	<p>18. S acknowledges that the school lacks experience with and faces problems in applying this programme to the general theoretical subjects (AA). S explains that the reason lies in the difficulty the teachers face to adapt to a new way of carrying out the lessons, and to prepare accordingly for a successful co-operation.</p>	
<p>19. F: Men hvorfor er problemet fokusert i AA og ikke med drama, eller FO? R: Problemet er det at, fordi at på drama, formgivning, så har man en mer praktisk opplæring.</p>	<p>19. S specifies that it is especially the general theoretical subjects that face this problem because they lack a practical character.</p>	
<p>20. På drama når de skal lage en forestilling, ikke sant, de skal øve, elevene gjør mye selv, de skriver ofte stykket selv, setter seg ned og skriver en tekst, dem kan få et stikkord som kan være en juleavslutning, for eksempel som vi har i 'Santa' kirke hvert år, den kan de ha som en juletentamen, med å skrive en slik juleforestilling, det kan være noe stikkord</p>	<p>20. S illustrates that in practically oriented subjects, the students actively participate in the creation, execution and evaluation of the learning work by: a) determining the contents of the work led by main themes; b) producing the work; c) executing the work after they have decided on the working tools, how to make use of the working area and after having contacted external sources and by d) assessing the final</p>	<p>20. S illustrates that in practically oriented subjects, the students can participate actively in the main aspects of the working process; this requires elaboration of a theme, choice of the correct working tools, efficient use of the available means, successful co-operation, assessment of the results and identification of improvements.</p>

<p>kanskje på hva som skal være med, [...] meningsløshet, høytid, omsorg, så det kan være sånne stikkord, og så skriver de et stykke selv, de lager eller velger kostymer selv, kanskje skriver om det som skal bli med, hvordan man skal bruke kirke og kirkerommet og skal samarbeide med presten på 'Santa' kirke, og fremføre det for andre elever. Da får de med seg masse av den her kritiske tenking, kanskje hvordan velger de nå, etterpå evaluere hverandre, hvordan var nå det her, var det vellykket å gjøre sånn og sånn, hvordan kunne vi hadde gjort det bedre.</p>	<p>product and each others' accomplishment, also by examining other alternatives that could improve the result.</p>	
<p>21. F: Så hvor ligger forskjellen med AA? R: Altså, på AA så har man jo den her klassiske oppdelingen i fag, man har til norsk, engelsk, matematikk, naturfag, økonomi, informasjonsbehandling og det er ikke så lett å lage praktiske oppgaver i forbindelse med de her fagene. Noen lærere gjør det med Ibsen, hvis de skal gjennom Ibsen, så lager de, de spiller inn, lager en, spiller inn, en oppsetning av et stykk, ikke sant, ja, bruker noen timer til det...</p>	<p>21. S points out that active participation of the students requires a practically oriented assignment. S explains that this is difficult to be achieved in the general theoretical subjects (AA), with a few exceptions (e.g. dramatising a literature piece).</p>	<p>21. S points out that the active participation of the students in the theoretical subjects (AA) is hindered by the lack of a practical character concerning of the working assignments. The few exceptions comprise of combining pure theoretical elaboration with practical activity, by actualising theoretical situations.</p>
<p>22. Kan si det at det er så mange mål, altså mange momenter i læreplanen for AA, at du kan ikke bruke veldig lang tid på å gå gjennom hvert enkelt mål da. Du må drive med her forelesningsformen mer hvis elevene skal ha hørt om de ulike tingene som står i læreplanen. Eksamenspress, er</p>	<p>22. S states that the volume of guidelines and goals the curriculum sets determines the way learning occurs, i.e. by active student participation or traditional lecturing. In the case of the general theoretical subjects (AA), use of traditional lectures is indispensable, as a large volume of material</p>	

<p>noe, eksamen vil ofte jo teste slik detaljkunnskap i en rekke områder.</p>	<p>needs to be covered within certain time limits.</p>	
<p>23. Men for eksempel i mediakunnskap så vet vi at elevene dem får som vanlig oppgave å lage ei forside på Dagbladet, får lagt ut ting på nettet, får noen tekster osv. som de skal bruke til å lage god Dagbladforside, det som de syns er god Dagbladforside. Det kan de bruke en måned på, de skal bruke et femtimersfag, i fire uker,</p>	<p>23. S says that in subjects with a more practical orientation, the time-plan allows the students to carry out assignments by creating products that require acquiring information from sources outside the textbooks and making personal judgements.</p>	<p>23-24 In contrast to the general theoretical subjects, the practically oriented subjects have fewer learning goals, which provides the students with more time, and thus allows them to carry out practical assignments.</p>
<p>24. slik kan man nok ikke gjøre i fag som norsk og naturfag, fordi at da rekker man rett og slett ikke gjennom de ulike punktene som står i læreplanen, da blir det for mye som elevene ikke har jobbet med.</p>	<p>24. S contrasts that with the general theoretical subjects (AA), where the students do not have the freedom to create products in a practical manner, due to the large volume of the learning material they have to cover within a limited time.</p>	
<p>25. F: Så hva kan gjøres med det? R: Det er tre ting som bør gjøres med det. For det første, så bør man skrive om læreplanene, bør man gå i bort fra ideen om at elever i norsk skole skal vite noe om alt. For slik er det, man begynner med -ikke med det gamle Hellas- men man begynner med det gamle Egypt, ikke sant, ja, kulturen i Mesopotamia og Babylon og Egypt og så får man med seg hele den gamle historien, helt fram til i dag. Naturfag, så lærer man nesten om det meste, men bare bitte litt da, blir ganske overfladisk. Jeg tror at man må gå bort i fra det, at elever skal kunne noe om alt. Redusere rett og slett hva de skal</p>	<p>25. S supports the AA syllabuses promote the acquisition of general superficial knowledge on a large area, instead of deep knowledge of a narrow area.</p>	

<p>gjennom, og jobbe mer grundig med enkelte tema. Slik som man gjør i en god del yrkesfag, det tror jeg. Det var punkt 1.</p>	<p>26. Punkt 2 er at man må egentlig redusere, forandre eller fjerne eksamen. Vi er ganske mange nå rektor på videregående skoler som syns at man kan ta bort eksamen. Den motvirker mye av den her jobbingen med at vi kan bruke mer tid på å gjøre eleven kritisk til sin egen tenking. Det blir veldig mye reproduksjon av kunnskap fordi det eksamensmålet, fortsatt målet selv om eksamen har blitt atskillig forbedret de siste åra, nå er det en rekke nye eksamensformer som åpenbokeksamen, for eksempel du kan ha med deg læreboka, det bruker jeg også i min kjemiundervisning, skal prøve nå etter Påska, så får elevene ta med seg læreboka og bruke den i prøven. Slik at da stiller jeg ikke spørsmål der eleven kan skrive av fra boka, da vil de få mer resonnement og det som minner litt mer på dette her.</p>		<p>26. S advocates that the exams counteract the schoolwork done, as they ask for reproduction of knowledge facts included in the textbooks, instead of asking for mental elaboration of the facts given, by use of additional information sources. S states the school has made some attempts to adopt the exams to the above.</p>		<p>26-27. S advocates that the exams require mere reproduction of knowledge facts included in the textbooks, instead of asking for mental elaboration of the facts given, under the light of additional information sources. This counteracts the development of the students' thinking and deprives the information of its usefulness.</p>
<p>27. F: Så du mener at eksamensformen motvirker denne treningen, fordi... R: Ja, det mener jeg veldig klart. Eksamen påvirker skolen ved å pugge kunnskap. Så elevene får produsere masse fakta og alt for liten grad, å bruke det selv.</p>	<p>27. S stresses that the aim of the exams is to test the ability of the students to just reproduce the information given in the textbooks; this does not enable them to investigate the information in a way that they benefit from it.</p>				
<p>28. Det tredje punktet det er arbeidstidsavtale for lærerne som og er veldig rettet etter fag. Læreren skal</p>	<p>28. Thirdly, S claims that the working agreement for the teachers appoints only responsibility of what to be taught and not how.</p>				

<p>undervise i et fag, han skal møte sine elever i faget, etter en lesepliktavtale som regulerer hvor mye læreren skal jobbe i ulike fag, og egentlig motivker mye av det vi jobber med ellers også. Læreren kan undervise i engelsk og i fransk, han har ansvar for at elevene lærer noe engelsk og fransk. Har ikke noe ansvar for det som står her. Altså blir det veldig tilpasset det ansvaret.</p>		
<p>29. Nå har jo vi prøvd på forskjellige måter å sørge for å ta vare på det som står i den generelle læreplanen, det kan f. eks. gjøres i det vi kaller modultimer, miljølærings timer, alle grunnkurs hos oss, alle sju grunnkurs, har en slik time i uka. Der klassestyrene, den som er leder for klassen, tar å bruke tid på å gå gjennom alt i fra...klassestyrene går gjennom f. eks. studieteknikk, sier noe til eleven om hvordan han skal arbeide med stoffet, for å lære det best mulig.</p>	<p>29. S states that the school tries to ensure that the core curriculum is being applied, by having the class leader discussing quite often with the students various issues regarding school work matters.</p>	
<p>30. Det kan være stoff som gjelder rusmidler, det kan være stoff som gjelder hvordan man forbedrer miljø i klassen hvordan man kan forhindre konflikter mellom elever, alle de her daglige problemer som elever også er opptatt av. For at en elev, han er jo ikke en fagperson inn i hodet sitt, en elev er jo et menneske, med alle de bekymringer og sorger og gleder som et menneske har. Så 'fageleven' blir jo bare en liten del av det</p>	<p>30. S emphasises the significance of viewing the students primarily as human beings, in their totality, by illustrating that the topics of those discussions cover both school matters and various situations met in everyday life, which the students are concerned about.</p>	

<p>der mennesket som...</p> <p>31. vi prøver nok å legge ganske stor vekt på det å se elevene, og ser, altså læreren ser inn i øyene for eksempel på hver enkelte elev hver dag, kan være et mål for en kanskje spesiell klassestyrer som har tid til å se hver enkelt elev også de som er sjenert og holder seg unna og ikke bare der bråkete guttene som ofte trekker på seg oppmerksomhet...</p>	<p>31. S specifies that the class leaders attempt to engage at a personal level with the students, by being attentive to each one individually.</p>	
<p>32. F: Altså klassestyren er en lærer... R: Klassestyrer er en vanlig lærer, men du kan si det er jo en lærer som vi mener har spesielle forutsetninger for å arbeide med elever da, også med den menneskelige sida.</p>	<p>32. S explains that the class leader is chosen according to his/her ability to appeal to all the aspects of the students' life, not only school matters.</p>	<p>32-33. S stresses that the class leaders are particularly inclined to approach the students by appealing to both their everyday and school life; the school provides an analogous training.</p>
<p>33. Vi hadde et eget klassestyrerseminar, et sånn to dagers kurs i høst, for dem som er klassestyrere i år. Da gikk vi gjennom alle de her tingene som en klassestyrer skal være oppmerksom på, jobbe med, diskutere ting, og så har vi jo da i tillegg den der ukentlige timen hvor klassestyrer da har to samtaler med hver enkelte elev, hvert år, dem snakker om innholdet i den generelle læreplanen, om hvordan eleven har det som menneske men også lite grann om det her med hvordan eleven arbeidet, om han fikk tid, om han er samarbeidsvillig, kanskje alle de der egenskaper som er nødvendig i arbeidslivet ellers også det å kunne lære seg å jobbe sammen med andre.</p>	<p>33. S explains that these class leaders receive a special training and that they meet the students quite often throughout the school year, where they discuss about both educational and everyday matters.</p>	

<p>34. F: OK. Hvis vi snakker litt utenfor 'Aktivt Prosjekt', og spesielt om VKI, fordi dette her [avsnitt 2] kommer under kritisk tenking. På hvilken måte gir lærerne anledning til elevene til å vise kritisk tenking inne i klasserommet?</p> <p>R: Jeg tror nok det at veldig mange av de lærerne som jobber i norsk skole i dag, dem var ung selv på 60 og 70 tallet. Der ungdommen var veldig kritisk til samfunnsoppbygningen. De ønsker nok at elevene skal være kritisk til samfunnet generelt og informasjon, kunnskap...vil nok ofte forsøke å gi elevene anledning til å diskutere, ikke sant, hva syns du om det her, hva syns du om homofile prester, er det riktig å ha homofile prester i norske kirker, så de stiller den typen spørsmål og forsøker å engasjere elevene i en kritisk tenking rundt samfunnsdebatten eller om faget for den del. Det her med naturvern, miljøvern, såne ting. Så jeg tror nok at lærerne generelt gir elevene veldig mange arena der de kan diskutere, der de kan trene opp sin kritiske tenking.</p>	<p>34. S states that the teachers give incentives and space to the students to question and examine issues covering both subject issues and issues involved in of everyday life, so as to come to own judgements regarding their presence. S supports that the teachers are open and seek to have discussions in the classroom due to their own attitude when they were young, i.e. they were setting the society situation under examination.</p>	<p>34. S states that due to their own earlier inquisitive attitude, the teachers motivate and provide the opportunity to the students to engage in a mental examination of various situations, ideas and norms, regarding negative and positive aspects of their presence and purpose they serve.</p>
<p>35. F: Men kommer det an på faget, eller?</p> <p>R: Det kommer det an på faget, fordi at, det er klart at i et fag som matematikk, så er det kanskje ikke da muligheten for kritisk tenking så stor, selv om læreren kan da lage oppgaver som både tar i seg samfunns spørsmål, og der elevene må lære seg til å tenke kritisk gjennom</p>	<p>35. S advocates that in order to have mental elaboration in purely theoretical subjects, the students have to be given assignments related to issues around society and everyday life.</p>	<p>35-37 S indicates that critical thinking requires assignments which are related to everyday issues, so that the students can use their personal experience in order to examine the truthfulness and correctness of the information. In the case of the pragmatic subjects, the above is achieved when the assignments</p>

<p>hvordan man går fram for å komme fram til et riktig resultat.</p>		<p>either are directed towards everyday issues, or combine information from other subjects of a more practical nature.</p>
<p>36. F: Hvorfor sier du at i matematikk det er vanskelig å vise kritisk tenking? Kunne du vennligst forklare det litt mer? R: Det er fordi at matematikk er et logisk fag, altså vi kan dra det ned til det latterlige og gi forskjell og si det at en pluss en er to, det går det neppe an å ha noe særlig kritisk tenking rundt,</p>	<p>36. S explains that in these subjects with a pragmatic character (i.e. mathematics), intellectual examination of information is not possible.</p>	
<p>37. men hvis du lager en oppgave som tar for seg noe, et problem fra den virkelige verden, så er det klart at da må man jo være kritisk i forhold til det regnestykket man lager. Om feilkilder, om årsaker til at det stykket her kan bli feil, altså vi ser ofte den derre sammenligningen mellom matematikk og fysikk eller matematikk og kjemi, som jeg har, det er mange feilkilder man kan få inn. Det er også kritisk tenking i den forstand at man da må se på...</p>	<p>37. S explains that critical thinking within the pragmatic subjects is employed when the students are given assignments which involve issues the students have experience with, i.e. either taken from everyday life, or are combined with other subjects of a more practical nature. S specifies that this occurs because then one has the opportunity to intellectually examine the truthfulness and correctness of the information given, as one has own experience with it from everyday life.</p>	
<p>38. F: Kunne du kanskje gi meg et litt mer spesifikk eksempel for å skjønne litt bedre hva du mener? R: Med matematikken? F: Ja. R: På hvordan man kan trene elevene i kritisk tenking? F: Ja. R: Det er spørsmål hvor vanskelig jeg skal gjøre det da. Det kan være alt i fra det at man lager et regnestykke så kommer</p>	<p>38. S situates the demonstration of critical thinking.</p>	

<p>man fram til det usannsynlige svar. Altså jeg husker veldig godt den oppgaven som ble gitt til grunnskole eksamen i 9. klasse her,</p>	<p>39. der man skulle regne ut, jeg tror regnestykket var det at 100 viskelær koster 50 kr, hvor mye koster et viskelær Da har noen elever bare ganget de to tallene sammen og fått at det koster 5000 kr, noen har delt 100 på 50 fordi at tallene stod i den rekkefølge i oppgaven, mens andre da har delt 50 kr på 100, da altså har fått det riktige tallet, ikke sant.</p>	<p>39. S explains the students had to execute a rather simple mathematical calculation, where a) the facts given had a 'real' character, were related to a situation from everyday life, and b) the exact relation between the numbers given had to be found by the students themselves. S illustrates that some of the students related the numbers based on the most apparent association with regard to the external features of the numbers, which was the wrong thing to do.</p>	<p>39. S indicates critical thinking can be demonstrated under the execution of a problem which has features pertaining to a real situation, and asks for a discovery of the way the given elements should be related; that requires moving beyond the obvious.</p>
<p>40. Så det er klart at når man gjør slike enkle stykker så må man være kritisk til hvordan man setter opp tallene, og hvis man svarer at et viskelær koster 5000 kr, så bør man jo egentlig skjønne at det er feil da. Da bør man i alle fall skrive under at svaret må være feil, som enkelte elever gjør noen ganger. Uten at de nødvendigvis skjønner hvorfor.</p>	<p>40. S indicates that the correct solution of the problem demanded that the students examine closely how to relate the numbers. Those that solved it in the above wrong way, should have realised that the answer they provided was mistaken, as it would not be possible to encounter in an analogous situation in everyday life. S specifies this recognition does not need to be followed by an apprehension of what is actually wrong in the way the problem was solved.</p>	<p>40. S explains that the results obtained should be evaluated by using one's everyday knowledge and experience so as to control the presence of inconsistencies. Simultaneous comprehension of the reasons behind a mistaken solution does not necessarily take place.</p>	
<p>41. Så kan det være regnestykker som går på, ja, i forbindelse med naturfagene, kan være regnestykker som viser, jeg gjorde nettopp en oppgave selv i en klasse her,</p>	<p>41. S situates another instance of critical thinking demonstration.</p>		
<p>42. der de skulle måle en så kalt spenningsrekke, så jeg satte metallene i etter hverandre i den graden de reagerer med hverandre, det hadde vært gull og</p>	<p>42. S explains the students were given an assignment to examine the situation created when certain metals were put together in such a way that they would react with each other in a</p>	<p>42. S explains the assignment consisted in observing the reactions of given related items, whose properties were of a known nature.</p>	

<p>sølv på den ene sida og så har du magnesium og sink på den andre siden – magnesium og sink reagerer veldig lett-</p> <p>43. da er det sånn at aluminium, den blir ikke, den passer ikke inn da. Da skal jo elevene svare på hvorfor, hvorfor er det slik at aluminium, når vi måler spenninga som går gjennom de her metallene, hvorfor er det sånt at når vi måler den, så havner ikke aluminium rett i forhold til det som står i lærebøkene. Da må de jo finne en forklaring på det da. Hvorfor du får sånne feilkilder.</p>	<p>predictable way.</p> <p>43. S elaborates that another object had been added in the above situation, that when reacting with the rest, the results obtained were unexpected in relation to the theoretical knowledge and the individual agencies of the object. The students were thus to come with an explanation of this inconsistency between the theoretical known facts, and the facts seen in reality, in practice. Such an explanation required a synthesis of the characteristics of the given objects in relation to each other, and not only independently.</p>	<p>43. S specifies another item of known properties was added to the above, which however behaved in an unpredictable way when handled. The students had to provide an explanation for this inconsistency found between theoretical knowledge and practical application, which required evaluation of the items in a holistic way.</p>
<p>44. Og det er klart det har med kritisk tenking å gjøre innenfor naturfagene, i hvor stor grad det oppøver elevens kritiske sans til den virkelige verden, i forhold til det de ser på TV, f. eks. det skuespillet 'Big Brother' og på en måte sånne såpeopera, ikke sant, ja, eller 'Hotell Cæsar', eller hva det er for noe, altså om de klarer å forstå at det er en uvinkelig verden som beskrives, det er jeg litt usikker på da, jeg tror kanskje ikke at den treningen i naturfag gjør at dem klarer å være kritisk til ting rundt seg på den måten, det tror jeg nok ikke.</p>	<p>44. S doubts whether the type of training in thinking the students get in subjects of a more theoretical character can be transferred to other type of activities. This concerns especially everyday life situations, and whether the students are able to judge their truthfulness.</p>	
<p>45. F: Så hvordan kan læreren sikre at elevene utvikler eller bruker sine kritiske tenking? R: Jeg tror ikke at lærerne kan sikre det,</p>	<p>45. S says that the teachers can provide the students with the opportunity to apply critical thinking, without being able to check its actual application.</p>	

<p>men de kan jo oppfordre og oppøve den kritiske sansen.</p>	<p>46. Det tror jeg faktisk at det foregår i veldig stor grad, i veldig mange fag, men det foregår kanskje litt mye på lærerne sine premisser og lærerer i videregående skole er generelt ganske kritisk til samfunnsutvikling, nettopp p.g.a. sine og så litt revolusjonære begrund, veldig mange lærere har et kritisk samfunnsyn. Veldig mange lærere f. eks. har utmeldt seg av den norske statskirke. De befinner seg ganske langt på den venstre sida politisk. Jeg tror nok kanskje at de ofte vil at elevene skal være likedan som det de var selv, altså veldig kritisk og spørrende,</p>	<p>46. S stresses that the teachers are more inclined to give the opportunity to the students to demonstrate critical thinking, when they themselves have an inquiring attitude and are opposed to the societal established norms.</p>	
<p>47. det er ikke elever i dag, det har mye med samfunnet å gjøre, tror jeg. F: Hva mener du med det? R: Det tror jeg, det blir en lang forklaring som ikke har særlig mye med spørsmålet ditt å gjøre, men altså norske samfunnet er veldig egoistisk da. Vi lever i -etter min oppfatning- i et egoistisk samfunn, der alle er veldig opptatt av seg og seg selv. Altså egoistiske menneskesyn. Dem er ikke så opptatt av hvordan det går med andre mennesker og det tror jeg har en del med noe som oppstår ved rikdom, tror jeg. F: Så mener du at dette her har noe med kritisk tenking å gjøre? R: Det tror jeg. Man blir lite kritisk til det som foregår rundt seg i samfunnet. Det</p>	<p>47. S advocates that the students nowadays lack an inquiring attitude as they are living in a society where people do not show consideration for others but themselves, and thus do not develop an interest for examining situations outside their narrow personal surroundings. S says a reason for this situation is the people's high financial status.</p>	<p>47. S indicates critical thinking requires an attitude of interest for persons and situations outside the narrow limits of oneself. S believes the high financial status of people nowadays is counterproductive to the development of such an attitude; this concerns the students as well.</p>	

<p>tror jeg absolutt.</p> <p>48. Men det er klart at jeg har jo tro på det som jeg har snakket om tidligere, det med å jobbe, at eleven utfordres til å jobbe med et egen hånd, til å delta med et egen hånd, at han tvinges til å være med på å gjennomføre det her læringsarbeidet selv –vi har lenge i Norge hatt den slagord som heter 'ansvar for egen læring', der vi ønsker at elevene skal overta mer av det der ansvaret selv, at de skal jobbe med stoffet selv, at de ikke skal mates med teskje med kunnskap.</p>	<p>48. S states that it is very beneficial for the students to be actively involved in the learning process, i.e. to be responsible for elaborating and examining the information and knowledge given.</p>	<p>48-50 S supports active student participation in the central aspects of the working process. She indicates that in order to achieve that, the school's structure should consider students and teachers as of the same authority, regarding the possession and communication of knowledge, and hence give corresponding type of responsibility to the students.</p>
<p>49. vi ønsker ikke en sånn disiplin, en skole som er veldig pisket på disiplin og hierarkiske strukturer, der læreren foreleser til elevene, det ønsker vi ikke. Det blir veldig dumt for den er, det tror jeg nok enda mere forsterket at eleven blir passiv og mottaker av informasjon.</p>	<p>49. S states that the active elaboration of knowledge and information given at schools requires a school organisation which considers students and teachers equal regarding the possession and conveyance of knowledge.</p>	
<p>50. Det jeg tror på er at vi kan få elevene til å jobbe mer aktivt selv med læringa, ta mer ansvar selv for det som foregår. Det er den generelle, kan du is, troen på det vi ofte kaller for elevmedvirkning,</p>	<p>50. S supports that when the students assume more responsibility for the learning process, they are involved into it at a higher degree.</p>	
<p>51. pluss at ved norsk skole vi har alle mulige elevkategorier innen sammen skolen, innen samme klassen, Vi er en spesiell skole... F: 'Alle kategorier mener du... R: Alle elever fra dem som er sterkt funksjonshemmet til dem som har lave evner til å lære seg ting, til de veldig</p>	<p>51. S underlines the significance of adopting such a pedagogical learning method that allows all the students to benefit from, as the classroom is not homogeneous concerning the students' level of performance.</p>	

<p>flinke, de går i samme klasse, alle går i samme klasse. Det lager en veldig utfordring for læreren, å få med seg alle sammen, fordi at det som motiverer noen, det vil kanskje demotivere andre sånn at vi har lagt slike læringsstrategier som drar med seg så mange som mulig av elevene. Det jobber vi med, det er det som ligger i 'Aktivt Prosjekt', som vi er opptatt av.</p>		
<p>52. F: Hvis vi snakker litt om en annen ting: for å ha en vellykket læring, så må eleven vite først og fremst hvordan å behandle læringsstoffet, hvordan å lese på en effektiv måte. Så på hvilken måte lærer elevene hvordan å lese? R: Det var det som jeg var så vidt tidligere, at vi har i alle fall en egen time, en time i uka, for alle elevene som går på grunnkurs der dem tar opp det med studieteknikk. Studieteknikk er en del av det tema som skal taes opp der, obligatorisk. Klassestyret vil da gjennomgå det med elevene eller gir rådet hvordan man skal lære.</p>	<p>52. S explains the foundation course students are being trained into how to use studying techniques during an obligatory course which takes place quite frequently in the year.</p>	<p>52-53 S indicates the foundation course students receive obligatory training into studying techniques concerning the studying environment, memory enhancement and working conditions.</p>
<p>53. F: Hva består dette kurs av? R: Det er rett og slett en gjennomgang av... det finnes sånne små korte hefter om studieteknikk. Der man tar for seg det med repetisjon og hvordan man kan jobbe, ikke sant, i korte stunder, å ta pause og at man må ha gode arbeidsforhold og at kanskje det må være stille, eller alle rådene for husketeknikker, hvordan man kan</p>	<p>53. S specifies these techniques address the reading environment, memory enhancement and working conditions.</p>	

<p>memorere bokstaver og tall og hele den pakka her!</p> <p>54. F: Er det i forbindelse med fag, eller er det generelt?</p> <p>R: Det er et generelt kurs, og blir gjennomgått av klassestyreren i de andre klassene, om høsten når de begynner. Jeg er forholdsvis overbevist om at lærerne samtidig tar for seg den type huskereglene sine fag, ofte vil jo det bestå at læreren går gjennom det som er det viktigste i faget, sånn at elevene har noe å bygge på, huske det og det og det: Napoleons 1. 2. og 3. era, sånn at elevene har de viktigste tingene. Og så at han kan lese mer selv for å utdype den kunnskapen som de har fått av læren eller det som har fått i samtaler og arbeidet på skolen.</p>	<p>54. S explains these techniques are not taught independently of a specific subject; the class leader repeats them in the beginning of the second class (VKJ). S assumes the rest of the teaching staff deals with enhancing memory techniques within their subjects, especially by underlying the most essential information the students should pay attention to, in order to be able to remember. S adds the students are expected to seek on their own for further sources and expand the knowledge acquired at school.</p>	<p>54. S explains even though the studying techniques are taught independently of a specific course, they are sometimes applied later on in relation to a specific subject, where the teacher makes suggestions regarding memory enhancement. Those suggestions address directly the application of the technique, so that the students have just to execute it. S adds it is up to the individual student to further deepen the knowledge acquired with additional informational sources.</p>
<p>55. F: Og dette skjer på grunnkurs, eller?</p> <p>R: Det skjer jo på alle klasser, det her, men det skjer spesielt på grunnkurs. Når eleven kommer til videregående skole, fordi at videregående skole vil ofte være litt annerledes enn grunnskole, du har mer...farten vil bli større, gjennomgåing av fag, og kravet til kunnskapen vil bli større.</p>	<p>55. S underlines that the training in studying techniques takes place especially during the first class, as the students are required to make larger amounts of effort and deal with a larger volume and content of learning material.</p>	

TEACHERS

FO

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Først og fremst, hvordan forstår du disse to avsnittene? L: Ja, skal vi se, det første her om at opplæringen omfatter trening i tenking osv. Da ser jeg det i sammenheng med faget mitt selvsagt. Det er jo knyttet til det praktiske arbeidet, som er som jeg forstår det, at i det du jobber praktisk med ting, og etterpå går tilbake og drøfter det og snakker om det du har gjort, og sammenligner med det de andre har gjort. Og du kan gå på utstillinger, se i bøker,</p>	<p>1. S views 'training in thinking' in relation to practical work; it comprises of presentation of the work to the others, with the purpose of a) clarifying the working process followed and b) evaluating the work, by comparing it to both the other students' work and other work sources.</p>	<p>1-2 S indicates that 'practice in thinking' takes place when the students carry out an assignment in practice –with use of their theoretical knowledge- and then present the working process followed and evaluate their work.</p>
<p>2. og så på den måten så er det en slags vekselvirkning mellom det du lærer og du får inn teoretisk, og det du gjør praktisk da, gjennom skoleåret.</p>	<p>2. S explains that 'practice in thinking' is a continuous exchange between theoretical knowledge and practical application.</p>	
<p>3. Det andre her om elevens kritisk skjønn, og det med altså å vurdere, ytelser og ytringer, det går mye på at det vi gjør etter en periode, da vi jobber med en ting og det også å ha felles ofte gjennomgang av arbeidet, da vi snakker om hvordan har du jobbet i forhold til det målet som oppgaver hadde og på en måte blir målene standarden</p>	<p>3. S claims that 'critical judgement' and 'evaluation' is discussion of one's fulfilment of the work in relation to a pre-determined goal, which represents a standardised criterion to judge the work.</p>	<p>3-4 S considers the evaluation of the students' work as part of 'critical judgement'. It involves comparison of one's work to a standardised criterion (goal), and to the others' work (teacher and students).</p>

<p>4. og så blir dem veid opp imot det både selv, de kan veie seg selv opp imot og andre elever og lærere som uformelle vurdering.</p>	<p>4. S explains that this work evaluation consists of; assessment in relation to the goal, in relation to the others students' work and in relation to the teacher's work.</p>	
<p>5. F: Hva gjør du for å anvende disse formålene i klassen din? L: Det er vanskelig å si noe helt konkret for jeg føler at det sånn ting vi jobber med hele tida, jevnt over hele året. Det der med å så...i nesten hver oppgave de får så skal de gjøre seg forestillinger om personlig uttrykk, hva de vil ha, dra med, hvilke ting de syns er viktig å få med, hva de ville legge vekt på.</p>	<p>5. S feels that the application of 'training in thinking' and 'evaluation' is a consistent procedure which takes place constantly and continuously in the classroom, as the students themselves express their preferences on important aspects (i.e. theme, tools, points of emphasis) of each assignment they have to carry out.</p>	<p>5-7 While specifying the way the students are trained in thinking, S states they are continuously engaged in mental elaboration by making decisions on central aspects of their work. Concerning evaluation, S indicates the students constantly compare their work to the others' as a natural part of the working process.</p>
<p>6. Også å resonnerer hele tida, observerer hele tida, det er noe som gjentar seg. Vi jobber jo veldig praktisk, så det er på en måte sånn det foregår</p>	<p>6. S says that due to the practical nature of their work, the students are engaged in mental elaboration continuously.</p>	
<p>7. og samme om det å vurdere, det foregår egentlig hele tida, selv om det ikke er satt på timeplanen, også, så vil det foregå mellom elever for de sitter jo ved siden av hverandre. Det de gjør er veldig tydelig, så det vil bestandig være sånn at du kikker over "a, ja, du har gjort det sånn, du. Jeg har gjort det sånn, ikke sant, og hvorfor har jeg det når du har..." sånn sett så vil det være vurdering, men det er bestandig vurdering etter ei arbeids økt, når vi er ferdig med arbeid, så vil det bestandig være ei vurdering, der elever også får være med å vurdere seg selv og vurdere andre sine ting, og så i perioder og der</p>	<p>7. S claims that after an amount of work is carried out, work evaluation in the form of comparing one's work to the others' (students and teacher), is a continuous process; it takes place due to the fact that the students have a physical proximity to each other in the classroom. The students assess both their own work, and the others'.</p>	

<p>lærer selvsagt vurderer da.</p> <p>8. F: Hvordan vet elevene hvordan å gjennomføre denne vurderingen du snakker om?</p> <p>L: Det er litt forskjellig. Vi har noe som vi kaller ukas tegning her, og da skal alle elevene det går på omgang, de laget oppgaven selv. Og da skal de også ha plukket mål fra læreplan, som de tegninger skal vurderes opp imot. Så neste uke når de kommer med tegningen, så sitter de seg sammen to og to, sånn er det hver gang da, de skal sitte sammen to og to, og skriver vi opp vurderingskriterier på tavla, så spør de hverandre og så skal de presentere den andres sin tegningen for klassen da. Og der de sier litt om hvilke virkemidler som er brukt, og samtidig litt om de ulike mål om hvordan de klarte å nå de målene da. Det er en type vurdering som foregår hver uke.</p>	<p>8. S illustrates a type of work evaluation carried out periodically, with short time-intervals, where the students themselves decide; on the nature of the assignment and on which of the goals given beforehand in the curriculum will serve as a criterion for the assessment of the work. The students co-operate in small groups, where they present to the whole class the others' work, explaining both the various tools used and judging the result based on these pre-decided goals.</p>	<p>8-11 In an effort to explain how the students evaluate their work, S identifies three types of assessment, that take place on different time periods. Those require from the students: a) choice of the group-assignments and their goals, which serve as an evaluative criterion for the assessment that follows; b) group-discussion on one's work, followed by self-assessment and teacher's assessment, based on already given criteria and c) assessment with the class as a whole, without any specific criteria.</p>
<p>9. Men så har vi også sånn på slutten av en læringsenhet, hvor vi har delt inn året i åtte læringsenheter så har vi også en vurdering. De får et skjema der det står over og under middels og middels, og så står oppgaver nedover. Og så står måler for hver oppgave, og da kan de, de skal også gå sammen i gruppa først, og så diskutere tegninger litt sammen, men de skal selv vurdere seg selv, sett en kryss på der de syns om sine egne tegninger.</p>	<p>9. S describes a second type of work evaluation, which takes place with longer time-intervals and where the students are given already-made criteria based on which they judge their work on their own, after having discussed it in groups.</p>	
<p>10. Også gjør jeg det samme, som dem får</p>	<p>10. S adds that this second type of work</p>	

<p>av meg etterpå. Der er en annen form for vurdering.</p>	<p>evaluation involves assessment from the teacher as well.</p>	
<p>11. Men vi kan også ha som helt uformelt som vi bare, når vi er ferdig med nok vi hanger det opp og så ser vi på det, uten å ha noen spesielle vurderingskriterier, vi bare prater om løs og fast. F: Så det har mest med kriterier å gjøre... L: Ja.</p>	<p>11. S describes a third type of work evaluation which is carried out with the participation of the class as a whole, and without any particular criteria in mind.</p>	
<p>12. F: Hvis vi snakker litt om den uformelle vurderingen, hvordan vet elevene hva de må se på, hvordan utvikler de evner til å vurdere? L: Vi jobber jo med ulike virkemidler når vi skal lære å tegne, og de skal jo se på mål 1 i tegning, som går på det å observere og gjengi en gjenstand, et motiv. Så er det tredimensjonal gjenstand, som skal bli todimensjonal på arket. Og da har vi forskjellige virkemidler som vi bruker for å oppnå det. Og de virkemidlene de går vi gjennom fra starten og vi snakker om dem jevnlig, både mens vi jobber praktisk og litt sånn på tavla, innimellom, så de får notert seg de ulike virkemidler også og under hver gang når vi vurderer så bli de snakker vi om de virkemidlene, hva du brukt her for å skape rom i det bildet her for å få volum i hva har du her brukt for noe... Så det er på en måte en gradvis, du begynner med enkle ting og så pakker du på litt etter hvert.</p>	<p>12. S stresses that in order for the students to develop the ability to assess, knowledge of the various working tools is necessary; this knowledge is directed toward the types of tools, the cases when they are used, and for what purpose, information that is repeated before the beginning of the work, during the work, and at each work-assessment period. This ability to assess develops gradually and is an accumulative procedure.</p>	<p>12 S identifies that the ability to assess develops gradually, and it requires knowledge of the central aspects of the working tools. S specifies this kind of information is given to the students during all the phases of the working procedure.</p>
<p>13. F: Når det gjelder eksamen, hvordan</p>	<p>13. S says that a condition for a successful exam</p>	<p>13-15 S identifies the conditions for</p>

<p>greier elevene å komme fram til eksamen, fra undervisninger til en vellykket eksamen? Hva må de gjøre?</p> <p>L: De må ha jobbet jevnt og trutt hele tida, tegne –hvis vi snakker om tegning for eksempel- så må de har tegnet mye og tegnet ofte, og være klar over målene, og så de må vite hva målene handler om fordi der er det de blir vurdert ut ifra der.</p>	<p>is hard and consistent work, with solid knowledge of the working goals, as they function as criteria for the work assessment.</p>	<p>acquiring a successful exam result: a lot of hard and consistent work, adequate knowledge of the evaluative criteria, and an efficient presentation of the central aspects of the working process followed.</p>
<p>14. Et av målene det er de må også kunne jobbe, ha brukt tegninger som et arbeidsredskap, og det å kunne vise til arbeidsprosessen, som for eksempel å lage skisser, og sånne ting. Det å kunne se på tegninger som en måte å kommunisere med andre på, og vite at dette her handler om kommunikasjon, at du skal formidle noe og på hvordan måte å gjøre det, du må vite hvordan ting skal være gjort, kan gjøres på ryddig måte, så du formidler det du har tenkt på en ordentlig måte.</p>	<p>14. S stresses that part of the work's purpose is communication; one of the requirements is also to be capable of clearly and efficiently describing the working process and means used.</p>	
<p>15. Hvis jeg skulle gi noen tips til elevene: tegn så mye som mulig, og vit hva er det egentlig som kreves av deg, gjennom målene, og så presenter på en ordentlig og forståelig måte.</p>	<p>15. S illustrates the conditions for a successful result; a lot of practice, solid knowledge of the work requirements and ability to communicate the work result in a clear way.</p>	
<p>16. F: Så du prøver å fortelle før hva de må gjøre for å komme seg til... L: Ja, det prøver vi å legge vekt på i tegning og i andre fagene også, selvsagt, vi snakker litt om det, at de blir vurdert uti fra målene, så jevnlig tar vi målene og</p>	<p>16. S explains that one part of the teacher's job is to show clearly to the students that the working goals comprise the criteria according to which their work will be assessed, and to elucidate the goals in detail so as to clear up misunderstandings.</p>	<p>16-18 While explaining her role in assisting the students with the exam preparation, S points out the complex and ambiguous formulation some of the working goals have. S thus indicates that a thorough examination of the goals is</p>

<p>leser dem opp og snakker litt om dem, om det er noen som ikke skjønner helt det og det ordet,</p>		<p>essential, so that teachers and students achieve a common understanding; this especially since the goals comprise the evaluative criteria for the students' work.</p>
<p>17. jeg synes jo at mye av det er vanskelig forklart, og synes jeg det kunne ha vært gjort på en helt, mye kan tolkes forskjellig,</p>	<p>17. S supports the goals are often written in a complex way, which leaves space for various interpretations and understandings.</p>	
<p>18. så det er viktig at vi i alle fall er enige om hva det er, det betyr det som står i målene... at jeg vet også at de vet hva det betyr.</p>	<p>18. S stresses the importance of achieving a common understanding of the goals, both for the students and for the teacher.</p>	
<p>19. Hvis det er noen elever som har vanskeligheter med å forstå hvordan de må forberede seg til eksamen, hva kan du gjøre da? L: Vi må prøve å så prate med dem, hva det er de synes det er vanskelig,</p>	<p>19. S says it is essential to clarify together with the students the difficulties they face while preparing for the exam.</p>	
<p>20. det faget her, tegningen det er jo det er ikke noe du kan gjøre, å lese på ei uke før eksamen, det er resultat av hardt arbeid hele høsten og hele året gjennom.</p>	<p>20. S emphasises that her school subject requires consistent, continuous and hard work.</p>	
<p>21. For å forberede seg siste uka, hvis det er noen som vil gjøre det, ville det ha vært å så gå gjennom de tegningene som en allerede har tegnet, og så se litt på hvordan har de blitt vurdert, og hvordan, hva kan jeg lære av det. Hva kan jeg likesom gjøre på andre måte neste gang.</p>	<p>21. S says that those students who wish to prepare for the exams within a short time, should examine previously done work, by paying attention to the assessment carried out and to the alternatives existing for improvement of the work.</p>	

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Hvordan forstår du disse to avsnittene? L: "Elevenes kritiske.....standarder". Kritisk skjønn....det har nok med vurdering å gjøre, men derimot må vurdere ytelser mot standarder, på en måte, men klart det er nok at man skal strebe mot et eller annet da. Erfaring med vurdering av ytelser, ytringer mot 'standard' ...tenker du på i forhold til, i forbindelse med mitt fag?</p>	<p>1. S states that critical thinking is related to evaluation according to standards and that it involves opposition.</p>	
<p>2. F: Ja, akkurat. L: Det er klart at erfaring det er det som vi jobber med i drama undervisning, måtte å skaffe seg erfaring på en annen måte enn gjennom andre fag, bruk av kroppen og stemmen og på en måte at du bruker deg selv i større grad for å få erfaring</p>	<p>2. S explains that gaining experience with critical thinking in drama differs from other subjects, as here one uses one's body and voice.</p>	
<p>3. Og det å vurdere ytelser det må du lære gjennom å arbeide selv men også gjennom å se andre sine ting og vurdere det selvfølgelig sammenlignet med det du laget selv, og å se profesjonelle teaterstykker, forestillinger... Så på en måte kan du godt si at en kan se de profesjonelle forestillinger, de er som en slags standard som setter et slags mål, eller at den måten de gjør det på, profesjonelle folket jobber på en annen</p>	<p>3. S says that training in evaluation involves producing and comparing the result to others'; a standard is needed, which comprises of the professionals' work.</p>	<p>3-4 S indicates that the students co-evaluate their work with the teacher in relation to a standard, i.e. the professionals' work.</p>

<p>måte altså. Da kan vi forstå hva standard er...</p>		
<p>4. Det er klart at det å vurdere er veldig viktig, det gjør vi også både oss, på en måte lærerne vurderer jo elever på et vis, og elevene vurderer hverandre. Og også oss sikkert da, tilbakevirker det, tilbake på oss, hvis et opplegg fungerer godt, så vil vi vurdere det for å finne ut, vurdere det ut ifra hvordan elevene takler det, hvordan en gjør det og sånn.</p>	<p>4. S explains that in drama, co-evaluation is performed among the students and the teacher.</p>	
<p>5. F: Hva med det andre (avsnittet)? L: Klart at det er en ting vi jobber med selvfølgelig også i drama, når det gjelder selve det, å gjøre seg i forestillinger, det er på en måte å gjøre seg forestillinger først, også skal du på en måte prøve å billedgjøre ting og så prøve å omsette det i en slags fysisk uttrykk. I drama tenker vi sånn at det er klart det er veldig nær sammenheng mellom kropp og sinn kan du si, at det likesom, ikke sant, at hjernen, sinnet, det mentale er noe for seg selv, det er side stilt med kroppen, at på en måte er en sammenheng at du gjennom det kroppslige og fysiske og på en måte erfaringer, hvordan du går gjennom ting ved hjelp av kroppen og sinnet samtidig som gjør vi i dramafaget. Så det er klart at, tror jeg på en måte at du kan forstå ting på en annen måte enn gjennom f.e. å lese det, eller...</p>	<p>5. S says that 'training in thinking' comprises of forming an idea and actualising it through bodily expression. S states that there is no division between body and mind, as both are necessary for carrying out acts.</p>	
<p>6. "Avgjøre.....eksperimenter" Hvis vi</p>	<p>6. S explains that 'reasoning' is mostly related</p>	

<p>ser på den resonnementet her da, det går mest på det muntlige, verbale. Når det gjelder produksjon, så må jeg skrive logg for eksempel, det er en slags resonnement, en slags refleksjon over det jeg gjør da. Slik at jeg få prøve å forstå hvorfor jeg gjør ting og på en måte få en likesom intelligent forståelse av hvordan ting bør gjøres, hvordan de kan gjøre det egentlig. Men å eksperimentere, selvfølgelig det, de er viktig alle tre egentlig, resonnement, og så går det på det å tenke og reflektere over ting du har gjort og observere selvfølgelig hva andre gjør...å observere det er også en veldig viktig bit...eksperimentere selv. På en måte tre sider av samme sak som henger veldig nær sammen.</p>	<p>to the verbal expression; it is demonstrated in drama through the keeping of a work journal, where the students must ponder over the reasons of their actions, and the procedure of carrying them out; this is achieved through study of the others' actions and trying them out. Pondering, studying and trying out are inseparable parts of training in thinking.</p>	
<p>7. Det er klart at det å uttrykke seg klart går det kanskje ikke på argumentasjon og drøfting, bevisføring men det å uttrykke seg klart i drama, teaterarbeid, det går på å uttrykke seg på en måte tydelig med kroppen sin, f.e. slik at i en forestilling, at du på en tydelig måte greier å få fram det du ønsker å formidle da. Det går med øvelser gjennom resonnement, observasjon, og eksperimenter så lærer man å uttrykke seg mer tydelig.</p>	<p>7. S clarifies that expressing oneself in drama is not connected to verbal, but to bodily utterances which are performed after pondering, studying, and trying out.</p>	<p>7-8 Commenting on the content of the core curriculum goals that refer to 'expressing oneself, S indicates that the formulation is foreign to her subject, as this expression is achieved through body and not speech.</p>
<p>8. Som det står her argumentasjon, drøfting, og bevisføring, det vet jeg ikke om, tror jeg det er ord jeg føler kanskje ikke hører så vanlig til dramafag da.</p>	<p>8. S states that the words the general curriculum uses to manifest this expression do not belong to drama.</p>	
<p>9. F: Hva gjør du da for å advente begge</p>	<p>9. S states that critical thinking is always present</p>	<p>9-12 S considers critical thinking as</p>

<p>avsnittene i klassen din? L: Kritisk skjønn f.e. Det er klart at alltid, når det gjelder kunstuttrykk, er alltid skjønnet inne i bildet da. Det kan ikke 'shoppe' når det kommer teater f.e. noen vil alltid syns et stykker er bra, mens andre synes det er dårlig, det vil alltid være en viss grad av skjønn inn i bildet.</p>	<p>at drama, in the sense of forming personal preferences for a theatrical piece.</p>	<p>constantly present in her subject, as the students: a) produce a work-piece and keep to certain rules and b) evaluate a work-piece according to already given criteria and their emotional reactions evoked.</p>
<p>10. Men samtidig den måten du jobber med, det så innfører du en del begrep som har med fag å gjøre, f.e. at en rolleperson skal holde seg i rollen, ikke dette ut, at et stykke skal på en måte ha en oppbygning, vi ser at handlinger går, at det handler om en ting og ikke springer fra punkt til punkt, at det er rytmisk og at det er flytt, at det er tempo som på en måte hjelper til å fortelle innhold, sånne ting, som du kom på en måte, se på uten i fra, bevegelse på scenen, dynamikk, sånne ting som på en måte setter ord på, dermed får du et grunnlag for det, skjønne det på et vis...</p>	<p>10. S adds that critical thinking is also demonstrated while one participates in a theatrical performance, as one has to be aware of and keep to certain canons.</p>	
<p>11. F: Mener du at du har noen spesielle kriterier som elevene må vurdere jobbet på? L: Riktig, ja. F: Gir du disse kriterier, eller.. L: Den måten det blir gjort på det er jo at når de får en oppgave, f.e. det kan være et prosjekt som skal jobbe med kanskje en periode, så får de en skriftlig oppgave, hvor står det målet fra læreplanen som de måtte bli vurdert i. Målene inneholder på</p>	<p>11. S explains that the students know beforehand the goal/criterion according to which their work will be evaluated.</p>	

<p>en måte moment som er typisk, så slik at jeg vet, før jeg begynner hva jeg blir vurdert i.</p> <p>F: Så du mener at kritisk tenking er advent i skolen når elevene prøver å vurdere jobben sin basert på noen kriterier.</p> <p>L: Ja, det kan du godt si.</p>		
<p>12. Ellers kritisk skjønn, egentlig, på en måte du har et skjønn men det bygger på objektive kriterier i bunnen på et vis, og samtidig vil jo om de er slekt med kunstuttrykk, det er jo hvis en forestilling f.e. treffer deg, hvis du på en måte føler at det angår deg, så ville du syns det er bra forestilling, selv om kanskje ikke alt er perfekt, mens en forestilling som er perfekt på et vis, når det gjelder alt det tekniske og alt, så hvis det på en måte ikke treffer deg, så ville du ikke like den så godt. På en måte er det skjønn det vil alltid være en liten grad av skjønn uansett, tror jeg, for den måten man jobber med følelser på et vis, det er jo emosjoner, du prøver å treffe, eller når du ser et teater forestilling så er det jo ikke tvil at hvis du blir revet med av følelsene dine, så er det det som gjør at du liker forestillingen eller ikke. Slik er det med alle kunst fagene, alle kunstuttrykk. Så helt objektiv går det ikke an å være. Men det må ligge i bunn altså alltid, selvfølgelig.</p>	<p>12. S acknowledges that critical thinking comprises of evaluation of a theatrical production based on objective criteria and emotional reactions to the performance.</p>	
<p>13. F: Hvordan greier elevene å gå fra</p>	<p>13. S explains that in order to have a successful</p>	<p>13-17 While presenting the conditions</p>

<p>undervisningen til eksamen? Hva må de gjøre for å ha en vellykket eksamen? L: Vi har som en prøveeksamen, som vi kaller tentamen, et par ganger i året før eksamen. På VK1 f.e. da skal det bli trukket ut til eksamen, slik at de må ikke komme opp i VK2 kommer de opp i alt. Men hvordan de forberede seg på eksamen? Når de får oppgaver så vil det være delvis lik oppgave som de skal få til eksamen. Det er klart at eksamen går over to dager, det er to dager å forberede seg på, så vises det fram den tredje dagen for en sensor eller utenforstående.</p>	<p>exam, the students practice a few times throughout the year with executing similar to the exam assignments.</p>	<p>for achieving a successful exam result, S indicates that the students: a) practice throughout the year with assignments similar to the exam ones. This includes practice in comprehending and presenting the central aspects of the working process and b) constantly receive information on the evaluative criteria.</p>
<p>14. Måten den sensor vurderer på det, er gjennom å se forestillinger, i tillegg til at han sammen med faglæreren har en samtale i etter tid om forestillingen. Så det går på refleksjoner, på en måte å resonnerer, på en måte å snakke om forestillinger og vise at de har forstått om det har gjort er bevisst og såne ting</p>	<p>14. S says that the evaluation carried out on the students' work comprises of watching their production and discussing it with them in order to inspect whether they are clear over their acts.</p>	
<p>15. Og det ligner på denne måten vi jobber oppi gjennom året, fordi da fører vi logg eller dagbok eller produksjonsrapport, og det ligner egentlig på den samtalen på et vis mer klart, du har mer tid og du skal tenke mer i en logg, men samtidig er det, det samme, du er ute etter det, så på en måte om du har forstått hva de driver med.</p>	<p>15. S emphasises that the students are being prepared for the exam throughout the year by keeping a work journal, which demonstrates their degree of understanding of the working process; that resembles the discussion of the theatrical production which takes place after the exam.</p>	
<p>16. F: Forteller du til elevene hva de må vite før de kommer til eksamen? Hvordan</p>	<p>16. S explains that the way to prepare students for the exam is to give them the opportunity to</p>	

<p>vet elevene hva de må gjøre for å forberede seg?</p> <p>L: Det går jo gjennom med at f.e. som tentamen også så kalt prøveeksamen, det er to stykker har vi på VK1 to stykker på VK2, og da de bli lagt opp akkurat på den samme måte som på eksamen...ville det bli gjort, hvor de får to dager å forberede seg på, og med to lærere vanligvis som vurderer, som gir karakter ved visningen, og gir karakter, på en måte vurdering av dem i samtalen etterpå.</p>	<p>practice on similar assignments a few times over the year.</p>	
<p>17. Så de får selvfølgelig tilbakemelding og så etterpå skriftlig tilbakemelding, og muntlig hvis det er behov for det, men vanligvis vi gir skriftlig tilbakemelding med kommentar til hver enkelt og vi prøver selvfølgelig å forklare hva som er poenget med en muntlig samtale. f.e. hva er det vi er ut etter, hva som skiller en god karakter fra en dårlig karakter. Vi føler egentlig at det er en ganske rimelig sammenheng mellom eksamen og undervisningen.</p>	<p>17. S says the presentation of the criteria for a good work -which takes place while the students get remarks on their preparation work- is a preparation for the exams. In that sense, the preparation for the exams is a constant process.</p>	
<p>18. F: Hvis det er noen elever som har vanskelighet med å forstå hva de må gjøre for å forberede seg til eksamen, hva slags hjelp kan du tilby?</p> <p>L: Slik at det er jo i dramafag, så jobber vi i grupper på eksamen, slik at det er grupper kanskje på 4-5. Det er jo læreren kommer går rundt og på en måte gir råd nærmest, men det er klart, det som kan</p>	<p>18. S states that the students work in groups and are expected to be capable of co-operating smoothly with each other and of finding out solutions themselves when problems in this co-operation arise; the teacher's role in assisting the students here consists of observation of their work and of giving advice on how to approach issues of co-operation.</p>	<p>18 S indicates that her role in assisting the students with their exam preparation involves giving advice on solving co-operation issues, since during the exams the students work in groups.</p>

<p>skje er at de i gruppe ikke fungerer alle sammen. Så det er jo på en måte -jeg har opplevd faktisk på eksamen... Vi kan gjøre en del, f.e. gi dem råd om hva de kan gjøre for -på en måte- komme videre, men så samtidig så har jeg, så er det en målsetning at de skal greie å jobbe sammen selv, og de fleste jobber sammen med de fleste andre, i ulike sammenhenger, og hvis de står fast, hvis de på en måte ikke kan videre så er håpet!- målsetningen, -at de skal ha lært hvordan de kan komme videre hvis de står fast. Da må de ta valg hele tida selvfølgelig, må velge om en eller andre veien og vanligvis bunner sånne konflikter i person ulikheter i mellom personer, som ikke greier å bli enig.</p>		
--	--	--

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Hvordan forstår du disse to formålene i forbindelse med ditt fag? L: Det var et vanskelig spørsmål.. F: Hva betyr de for deg?...i klasserommet.. L: Det synes jeg det er vanskelig å svare på.. F: Jeg ville bare vite hva du forstår når du har disse to formålene og du må anvende dem i din klasse. Hva forstår du at du må gjøre? L: Det er en prosess på en måte, og alle elevene når ikke det målet, det blir forskjellige grad av måloppnåelse for å nå fram til det her med å uttrykke seg klart, argumentasjon, drøfting og bevisføring, det er jo veldig få elever som skårer veldig høyt på akkurat det her.</p>	<p>1. S considers it difficult to talk about the presented curriculum goals in relation to her subject, and states that not all students achieve them (i.e. expressing oneself concisely in argument, disputation and demonstration) at a satisfactory degree.</p>	<p>1-2 S admits she faces difficulties in answering R's question about the core curriculum goals and their application in her subject. In her attempt to answer, S observes that only a few pupils achieve these goals at a satisfactory level.</p>
<p>2. F: Hva med kritisk skjønn? L: Ja, det er veldig få elever som skårer høyt på det.. som nå, f.e. som får en høy grad av måloppnåelse på kritisk sans...veldig få som når veldig høyt da.</p>	<p>2. S says that there are very few students that demonstrate a high level of critical thinking.</p>	
<p>3. F: Kunne du forklare hva kritisk skjønn betyr? L: Det er vanskelig...tenke selvstendig kanskje, og å trekke slutninger ved ting du har opplevd, ting du har tenkt gjennom og så i etterkant tenk over og så reflektere</p>	<p>3. S explains that critical thinking is found in the ability to manifest autonomous reasoning, and it comprises of the process of; forming judgements based on one's experience and reflections, and contemplating over the process followed afterwards.</p>	

<p>over og så kan du få kritisk sans da.</p>		
<p>4. F: Hva gjør du for å anvende disse to formålene i klassen din? ..eller om du kunne fokusere på kritisk skjønn.. L: Det har med forskjellige fag å gjøre, det har nok mer med norsk faget enn med franskfaget hvis jeg tenker som fag [begge to i VK1].</p>	<p>4. S states that critical thinking is more applicable to some school subjects than others.</p>	
<p>5. Hvis jeg tenker norsk så har det jo med hva slags type skriftlige oppgaver de gir, altså fremstillinger, og så etterhvert sånt kommer vi til drøftingsoppgaver, men det er jo på en måte det siste steget for at du må ha argumenter for og imot en sak, og kunne drøfte, ikke sant, rundt</p>	<p>5. S says that critical thinking is demonstrated in the written assignments the students produce, and it requires the ability to debate, i.e. argue for and against a given statement.</p>	<p>5-7 S indicates that 'critical thinking' is demonstrated in the task of debating, which depends on developmental factors and on the ability to perform autonomous reasoning. This ability can be developed by acquisition of for and against statements from others. S specifies the students can manifest critical thinking in the written assignments they produce, which involve debate.</p>
<p>6. og som sagt veldig få elever, hvis hele klassen som skulle ha tatt en sånn drøftingsoppgave i norsk, så er det veldig få elever som har fått en høy karakter eller fått en høy grad av måloppnåelse, for det er veldig vanskelig altså veldig, veldig vanskelig...vet ikke, i en klasse så er det kanskje bare, i en klasse på 25 stykker så er det bare 5-6- stykker som får en høy grad av måloppnåelse. Så det er kjempe vanskelig, det krever modenhet og det krever selvstendig tenking.</p>	<p>6. S explains that very few students achieve a high level of performance in debating, due to the difficulty of the task; it depends on the level of one's development and autonomy in reasoning.</p>	
<p>7. F: Men hvordan kan elevene utvikle disse?</p>	<p>7. S states that the ability to debate develops under group discussion by acquiring for and</p>	

<p>L: Vi diskuterer, f.e. enkelte ting, og da kan jo de elevene som ikke er så flink i det å få argumenter fra andre, noen ganger så bruker jeg å dele opp klassen i grupper og så kan vi sitte, og så hvis du får en påstand, og så kan to og to være for en påstand og to være imot. Og så kan du sitte og diskutere for og imot, så kan du...</p>	<p>against statements from others.</p>	
<p>8. F: Hva skjer når noen elever har problemer med å gjøre det? L: Ofte stopper det opp hos noen grupper, veldig mange grupper, og så de klarer ikke å argumentere, de kan ha bare ett eller to argumenter og så si de 'stopp'. Jeg bruker å gå rundt og hjelpe dem litt på vei også, men det er veldig ofte så stopper det opp...</p>	<p>8. S acknowledges that debates carried out in groups often cease due to lack of for and against statements. S states she assists the students in such cases.</p>	
<p>9. F: Hvis vi tenker på eksamen, hvordan kan elevene komme fram til eksamen? Fra undervisning til en vellykket eksamen? Hvordan kan de forberede seg? L: Hvis vi da tenker norsk igjen, så drøftingsoppgaver er ofte samfunnsfaglig rettene oppgaver, går på samfunnet, litt på politikk, f.e. argumenter for og imot likestilling f.e., og da må elevene for det første følger med i media, hente inn argumenter i fra media...det er veldig viktig fordi at også, kanskje, jeg vet ikke hvor mye de diskuterer seg imellom, fordi at på skolen så jeg driver ikke med så veldig mye å øve dem på å finne argumenter...fordi at i norskfaget så er det så mange forskjellige slags genrer de skal</p>	<p>9. S explains that in order to have a successful exam (i.e. a satisfactory debate assignment) one has to train on his/her own by attaining for and against statements from various sources.</p>	

<p>opplæres i, sånn at de må kanskje gjøre det på egen hånd også, og trene seg selv, å lese media, høre på dagsrevyen, på nyhetene...</p> <p>10. F: Og hvis en elev ikke klarer seg selv, og kommer til deg for å få hjelp med hvordan han/hun må lese, hva kan du gjøre da?</p> <p>L: Det er vanskelig fordi at det har med utvikling nesten med biologiske ting. Noen elever har kommet lenger, og noen elever har lett for å lære ting om samfunnet, lære seg å drøfte og argumentere for og imot, mens andre elever har veldig store problemer med det.</p>		
<p>11. F: Så du ikke kan gi noen konkret hjelp...</p> <p>L: Jo, altså vi kan sitte og diskutere i klassen, del opp klassen i grupper, sitte og diskutere. Men også elevene, vet ikke, hva slags tema de får på en eksamen så det kan være alt...men heldigvis, så finnes det flere oppgaver enn drøftingsoppgaver og argumentasjonsoppgaver på en måte, vi kan ta litterær analyse...</p>	<p>10. S states the propensity to debate depends on biological factors, i.e. level of development and ability to learn, thus assistance is difficult to be beneficial.</p> <p>11. S explains that students can be helped to improve the ability to debate by discussing in groups. S observes that students who face difficulties with debating, might not have to work on exam assignments that demand competency in this area, as there is the chance of a different type of exam assignment.</p>	<p>10-11 S believes the ability to debate can be improved by participating in group discussions. Nevertheless, as this ability depends on biological factors, those students that face difficulties have the opportunity to work on exam assignments of a different nature.</p>
<p>12. F: Er det noe konkret at du kan si for å vise dem hvordan å lese for å ha en vellykket læring?</p> <p>L: Ja, det jeg bruker å si til klassen min i norsk, det er at alle sammen i løpet av tre år før eksamen –fordi at norsk går over tre år og du har eksamen etter den 3. Klasse– en ting som er veldig viktig for meg da, er</p>	<p>12. S says that in order to prepare effectively for the exams, one has to practice with material that covers all kinds of written styles the school subject deals with and not only with these one is good at.</p>	

<p>at alle sammen, alle elevene må ha prøvd seg på alle genrene som vi går gjennom. Fordi at elevene har veldig lett for å ta den genren de er flink i å få gode karakterene i, men alle sammen i min norsk klasse i hvert fall, er nødt til å prøve seg i alle genrene sånn at de har i hvert fall prøvd seg minst en gang på argumentasjonsanalyse eller drøftingsoppgaver, og en gang på litteraturanalyse, og sånn. Sånn at de er i hvert fall litt forberedt før eksamen kommer da. Hvis vi tar sånn drøftingsoppgaver, eller argumentasjonsoppgaver, så vi holder ikke på så veldig veldig lenge med det i norsk...</p>		
---	--	--

STUDENTS

FO (FEMALE)

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det noen ting om kritisk skjønn og sånn...Hva er kritisk tenkning egentlig? Hva betyr det? E: Det er jo å tenke litt kritisk over det du gjør. F: Hva mener du? Kan du forklare det litt? E: At ... vurdere det du gjør, om det er bra eller dårlig og om du kan forandre ting du har gjort... F: Kan du gi meg kanskje et konkret eksempel i forbindelse med ditt fag? E: Hvis jeg lager et maleri og det er helt mulig at jeg lurar kanskje på om det hadde blitt bedre hvis jeg hadde brukt andre farger og forandret på komposisjon... F: Så hva gjør du når du tenker kritisk? E: Jeg bruker jo skisser og sånn for å finne ut om ulike komposisjoner og sånn passer inn... F: Mener du at du evaluerer andre alternativer, eller... E: Ja. F: Så det er det som foregår på kritisk tenkning.. E: Ja.</p>	<p>1. S says that critical thinking is found in the process of evaluating one's work, i.e. by examining alternative ways of improving the work.</p>	
<p>2. F: Gir læreren din anledning til å vise kritisk tenkning inne i klasserom? E: Ja.</p>	<p>2. S explains that the students demonstrate critical thinking by a) carrying out on their own a piece of work and c) evaluating the work</p>	

<p>F: Hvordan da? E: Vi jobber jo veldig selvstendig så vi får en oppgave som enten har laget selv eller som læreren har laget og da læreren er jo der hvis det er ting du vil ha hjelp med men ellers så er det veldig fritt å sitte der og få kritikk både fra seg selv og andre... F: OK, så du mener at dere jobber selvstendig, så dere kan evaluere deres egne jobb, eller... E: Ja.</p>	<p>themselves and receiving evaluation by others.</p>	
<p>3. F: Har din lærer vist deg hvordan å bruke din kritisk tenkning, noen tips kanskje.. E: De hjelper jo, så vi kommer i gang med prosessen av å finne ut hva som er best og sånn, men vi må jo selv bestemme om vi vil forandre og hva du synes det er best, og de kommer med råd og veiledning da. F: Hva slags veiledning, kan du gi meg et eksempel? E: Ja, for eksempel i form vi har Helene, så kommer hun med råd om forandringer, kanskje bruk av materiale og sånn, det er vi som bestemmer. F: Så det er rådgiving.. E: Ja.</p>	<p>3. S specifies that the teacher advises the students in finding the best way to carry out their work (use of means); the student takes the final decision.</p>	
<p>4. F: OK. Så hvis vi snakker litt om eksamen, eller prøver, hva må du gjøre for å ha en vellykket eksamen? Hvordan må du lese, på en effektiv måte? E: Det er jo helst å lese det en gang og skrive notater...</p>	<p>4. S says that in order to study efficiently, she reads the material, takes notes and writes keywords of the important points in relation to the goal.</p>	<p>4-6 S indicates that studying techniques are quite demanding; she received coherent training once (i.e. on keeping notes and drawing out the main points) and makes use of them sporadically.</p>

<p>F: Notater av hva?</p> <p>E: Av stoff som du vet er viktig i forhold til målet og så lese notater og kanskje lese i boka to gang så du forstår det før du skriver ned stikkord.</p>		
<p>5. F: Har læreren gitt deg noen tips om hvordan å gjøre det?</p> <p>E: Nei men vi har hatt sånn kurs i studieteknikk.</p> <p>F: Når var det?</p> <p>E: Det var i fjor, grunnkurs.</p> <p>F: Så var det bare en gang at du hørt om disse ting, eller...</p> <p>E: Ja, det var som kurs, det var flere timer, så da lærte vi om det da... studieteknikk, skrive av notater, for eksempel bruk av små skisser så du skal huske bedre...i å få med det viktigste, hva som er viktigste...</p>	<p>5. S explains she had training in how to use studying techniques once: keeping notes, using written illustrations so as to enhance memorisation, and drawing the important points.</p>	
<p>6. F: Så bruker du disse teknikkene?</p> <p>E: Ja, det var veldig avansert teknikk, det var mye arbeid, men iblant bruker jeg den, eller føler jeg har bruk for dem...</p>	<p>6. S observes that she uses studying techniques sometimes only, and that the use of them is quite demanding.</p>	
<p>7. F: Så hvis du går til læreren din og ber om hjelp om dette her, hva slags hjelp kan læreren gi?...til å lese på en effektiv måte..</p> <p>E: Hmm...hun gir råd om kanskje hva som er lurt å lese på, men vi får kanskje ikke noen som spesielt råd om hvordan vi skal lese, de venter kanskje at vi vet selv hva som er best for oss...om hvilke måte vi har lyst til å lese på å lære best på...</p>	<p>7. S explains the teacher helps by pointing out the reading material one should study, without specific advice on how to handle it, as it is assumed that the students know best themselves the way to study effectively.</p>	

FO (MALE)

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det noen om kritisk sans, og kritisk skjønn...hva er kritisk tenkning? E: Å sette spørsmål på ting og ikke ta alt for god fisk liksom, stille spørsmål...prøve å gå litt dypere ned, prøve å finne ut essensen i det liksom... F: Kunne du gi meg kanskje et eksempel i forbindelse med tegning? E: Ja...hvis vi skal for eksempel, analysere et bilde for eksempel, vi kan se på bilde og vi kan gå ut kritisk eller vi kan bare se på det, si at det er fint, vi kan også ta og, gå gjennom de kunstneriske teknikker, se om den personen har utnytta dem bra nok ... F: I forbindelse med hva slags kriterier? E: I forhold til det vi har lært selv, for eksempel farge og fargelære...persepsjonslover...</p>	<p>1. S states that critical thinking embraces the examination of the information before accepting it and the attempt to discover its central points and meaning. S explains that this examination is carried out by using one's previous knowledge and working rules.</p>	<p>1-2 S indicates critical thinking involves intellectual examination of the information acquired and taking decisions in full awareness about the working methods and means used, a process that S feels does not take place very often during the classes.</p>
<p>2. F: Gir læreren din anledning til å vise kritisk tenkning inne i klasserom? E: Litt... F: Et eksempel kanskje? E: Vi har hatt en del oppgaver i det siste, der vi for eksempel hadde, vi har etter at oppgaven er ferdig, så går vi gjennom oppgave nøye, liksom at elevene står og snakker foran klassen, og går gjennom de forskjellige virkemidler. Men det blir ikke så kritisk da, det blir litt kritisk liksom, det</p>	<p>2. S explains the students have a rather small opportunity to demonstrate critical thinking; presenting one's work and explaining the procedure followed. S feels this process could have been carried out under greater use of critical thinking. S specifies that critical thinking is shown as one demonstrates that the choice of the specific way of carrying out the work was preceded by mental elaboration and examination.</p>	

<p>blir ikke, det kunne ja vært enda mer kritisk, kan jeg tenke meg...</p> <p>F: Så hvilke del var 'kritisk' av den prosessen som du beskrev?</p> <p>E: Det at læreren tar fatt i ting som andre ikke forstår eller at hun lurert på om vi var bevisst på det valget av forskjellige teknikker, om vi selv var bevisst på det uttrykket vi laget.</p>		
<p>3. F: Og har læreren gitt deg noen tips om hvordan å uttale kritisk tenkning kanskje?</p> <p>E: Nei, det har ikke, tror jeg...Jeg tror vi mer har lært hva vi skal tenke på, av kritisk tenkning og så hva slags ting vi skal se etter, men ikke hvordan vi gjør det, det tror jeg.</p>	<p>3. S says he has not been shown the way to demonstrate critical thinking, but rather what to think about.</p>	
<p>4. F: Og hvis vi tenker litt på eksamen, prøv, hva må du gjøre for å ha en vellykket eksamen? hvordan kan du lese på en effektiv måte?</p> <p>E: Hvordan vi må gjøre det bra?...Vi hadde nye eksamensform nå nettopp, som vi prøvd da, jeg synes det var kjempe vanskelig...vi hadde 2 praksisdager der vi skulle jobbe med sanne prosjekter, så det skulle være 1 skrive dag, og skrive dagen telte 50% del av karakteren og det var veldig vanskelig fordi at...når du første har laget et bilde, eller laget et...altså besvart oppgaven, i praksis, praktisk, og så skal vi ha skrive dagen og så skal vi da forklare hva vi hadde gjort, vi skulle forklare begreper og sanne ting. For å</p>	<p>4. S explains that the exams consist of a practical and theoretical part, and that in order to receive a high grade the exam answer should be in accordance with the teacher's expectations. S feels that an unconventional and unique elaboration of the exam assignment is evaluated negatively, unless it is done in a very skilful way.</p>	

<p>gjøre det bra på en sånn eksamen så føler jeg, og kanskje ganske mange andre, at man må på en måte gjøre det læreren forventer at vi skal gjøre, liksom, jeg tror det blir vanskelig å tørre å gjøre noe som er ganske provoserende...de som gjør det, de må gjøre det enten veldig bra tror jeg, for å få en bra karakter eller så ligger det ikke så høyt i alle fall...</p>		
<p>5. F: Så dere har ikke noe stoff å lese til eksamen, eller... E: Jo, det nye eksamensformen, vi får oppgitt et mål, i starten, og det de målene omfatter, det vi må lese på til den 3. dagen da, til den skriftlige dagen. Så vi har et mål at elevene skal kunne forskjellen på positiv og negativ form, for eksempel, så er det lurt å ha lest på det, på positiv og negativ form, til den 3. dagen.</p>	<p>5. S explains he reads in harmonisation with what the given learning goal directs.</p>	
<p>6. F: Så har læreren vist deg hvordan å lese effektivt? E: Nei! Det har hun ikke. F: Så læreren gir ikke noen tips... E: Har egentlig ikke gjort mye. Vi fikk faktisk, med den eksamensformen vi hadde nå, så fikk vi vite veldig lite faktisk, syns jeg da, vi fikk vite litt men ikke så mye da...før etterpå, etter vi har hatt den. Det hjalp ikke så mye! F: Så hvis du går til læreren og ber om hjelp, hva kan læreren gjøre? E: Jeg får vel hjelp hvis jeg spør, tror jeg. F: Hva slags hjelp?</p>	<p>6. S states he receives very little help from the teacher -i.e. explanation of the subject, and not how to study it effectively.</p>	

E: Forklare tema... tror det ikke er så mye mer å gjøre... tror ikke det er så mye mer enn det...		
---	--	--

DD (FEMALE I)

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det ganske mye om kritisk sans og skjønn, og sånne ting...hva er kritisk tenkning, hva betyr det? E: Jeg vet ikke, kanskje det betyr at det å ikke godta alt som det er, å stille seg spørsmålstegn til situasjoner...</p> <p>2. F: Kunne du kanskje gi meg et eksempel i forbindelse med dramafaget? Hvis vi snakker litt mer praktisk da... E: Ja...under en produksjon så er det viktig å være kritisk til både regiarbeid og det meste egentlig. F: Hvordan mener du det? E: Ja, altså vi produserer ofte sånn at vi viser for hverandre, og det er en liten gruppe som observerer og ser på og kan gi konstruktiv kritikk etterpå. For de er mye mer objektiv enn vi som har jobbet med den tingen. F: Så mener du at kritisk tenkning er å gi kritikk? E: Kritisk tenkning er vel...tenkning, ja vel, kanskje er ikke det samme som å gi kritikk, men neste stadium blir det vel kanskje å gi kritikk... F: Så det forberede seg for å gi kritikk, eller... E: Ja. F: Og du sa noe at det er objektiv, så må</p>	<p>1. S states critical thinking embraces the examination of information before accepting it.</p> <p>2. S explains that critical thinking is shown under the process of evaluating one's work in groups –thus receiving evaluation from others. The latter is essential and necessary, as the others are not directly participating in the production of the work, so they can observe it from outside and point out with greater ease what needs improvement. S states critical thinking leads to criticism.</p>	<p>1-2 S states that critical thinking involves elaboration of the acquired information and evaluation of one's work by others who are not directly involved in the production of the work. S believes this process enables one to employ criticism.</p>

<p>du være objektiv for å vise kritisk tenkning, eller...</p> <p>E: Nei, det må du overhodet ikke, nei. Men det er ofte kanskje lettere, først er man kritisk selv, den lille gruppen man jobber i, men så er det ofte...eller de nye kan ofte komme med god konstruktiv kritikk i tillegg til den kritikken som vi har klart å komme fram til, i grupper da...</p>		
<p>3. F: Så gir læreren din anledning til å vise kritisk tenkning inne i klasserom? E: Ja. F: Et eksempel kanskje? E: Hvis for eksempel det har med regi ting å gjøre, så kan noen av de elevene si 'nei, jeg synes det er bedre at...at det der har vært et rotete scenebilde. Kan du for eksempel sitte der i stede eller kan du finne en ny løsning?'</p>	<p>3. S states they demonstrate critical thinking by expressing their opinion in the classroom and by suggesting alternatives to improve the working results.</p>	
<p>4. F: Og har læreren kanskje viste deg hvordan å tenke på en kritisk måte? E: Vet ikke om vi har snakket så mye om hvordan vi tenker kritisk, vi har snakket mer om at det er viktig å komme, hvordan man skal komme med kritikken har vi snakket mer om. F: Så dere snakker om hva... E: Ja, hvordan skal man gi kritikk og så at det er viktig å si noe positivt først kanskje, og så komme med den konstruktive kritikken og vi snakker veldig mye da om at vi skal ta kritikk, at kritikken ikke er negativt, det er bare kanskje rettleddning til</p>	<p>4. S says they have not been trained in how to think critically, but rather in that a constructive criticism should include both positive and negative comments. S observes one should learn how to accept criticism as it is can help one improve one's work.</p>	

<p>ting som blir bedre.</p> <p>5. F: Og hvis vi tenker litt på eksamen, prøver, dere har noe stoff å lese til eksamen, ikke sant?</p> <p>E: Ja, muntlig eksamen.</p> <p>F: Så hvis vi tenker litt på det, hvordan å lese, hva må du gjøre for å lese på en effektiv måte, for å ha en vellykket eksamen? Hvordan må du lese stoffet?</p> <p>E: Jeg må skrive mens jeg leser for, eller jeg lærer mer når jeg skriver, så hvis jeg først skummer, og så blar jeg opp gjennom og teller hvor mange sider har jeg å lese, for å se hvor langt det er til å nå målet, og så tar jeg notater av det jeg vet som er viktige ting...</p> <p>F: Og hvordan vet du hva som er viktig, for å notere?</p> <p>E: Jeg ser det på overskrifter og kanskje ting jeg har mindre bekjentskap til, noterer jeg, jeg går litt lettere over...</p>	<p>5. S states that for an effective studying, she first organises the learning material time-wise, then reads once and at the same time keeps notes of the most important points, i.e. in accordance with the central theme and areas she lacks knowledge for.</p>	
<p>6. F: Har læreren gitt deg noen tips?</p> <p>E: Vi har hatt, i fjor hadde vi 3 timer med studieteknikk. Arbeidsformer du kan bruke og hvis du leser overskrifter først, så får du et overblikk over hva det handler om og så kanskje gå rundt litt mer på hva de forskjellige avsnittene handler om og fordype det skikkelig.</p>	<p>6. S explains they heard once about studying techniques, i.e. first be clear over the central theme, then skim, read paragraph-by-paragraph and elaborate in detail.</p>	<p>6-8 Even though S considers the short training she had on studying techniques (i.e. identification of the theme, skim, handle the material gradually) helpful, she only makes use of them irregularly, and receives no further encouragement to do so.</p>
<p>7. F: Bruker du disse teknikkene eller...</p> <p>E: Ja, delvis, ja. Det har vært så fint å få tips om dem, fordi du kanskje ikke tenker så mye over det først...</p>	<p>7. S feels that learning about studying techniques has been helpful as she would not have come up with such ways to handle the material with on her own. S observes she uses</p>	

<p>8. F: Så nå får du ikke høre on dem mer, var det bare i fjor eller... E: Ja, det var 3 timer, altså studieteknikk kurs. F: Og hvis du bør læreren om hjelp nå, hva kan læreren gjøre med det? E: Ja, han kan jo sikkert repetere det viktigste vi lærte i fjor! Jeg vet ikke... F: Men det skjer ikke vanligvis nå, eller... var det bare i fjor? E: Nei, det var i fjor så det er vel opp til oss selv, om vi vil videreføre det.</p>	<p>them partly. 8. S states the teacher's help includes repeating what has been learnt on studying techniques and that the students are not encouraged by the teachers to make use of them.</p>	
--	--	--

DD (FEMALE 2)

<p>MEANING UNITS</p> <p>1. F: Så her står det ganske mye om kritisk sans og kritisk skjønn...hva er kritisk tenkning, hva betyr det? E: Mitt begrep om det må være da at man kan se ting fra forskjellige sider og gjøre seg opp ei mening om ting uten å godta det noen forteller, umiddelbart, vet ikke...jeg syns mye...</p>	<p>TRANSFORMATION UNITS</p> <p>1. S states critical thinking includes examining information from various angles and forming an opinion about it, before accepting it.</p>	<p>1-2 S indicates critical thinking includes elaborating the information received and making own judgements, a process that she does not exercise during certain theoretical subjects; this occurs due to lack of access to the original informational sources, which are essential in order for this process to take place.</p>
<p>2. vet ikke, i hvert fall sånne enkelte fag sånn som norsk og sånn, der er det veldig sånn at tydelig, at det er bestemt hva vi skal lære, for eksempel i litteraturhistorie og sånn her, hva vi skal mene om Ibsen og Bjørnson og de 4 store, og alle forfatterne, det er veldig når det står om dem i det norskeboka, så er det veldig bestemt på foran hva vi skal mene om dem, som sånn siste halvdel av 18 tallet, fremstilles i norskeboka som sånn er kjempe svært og Norge var den største nasjonen i verden omtrent, ikke sant, midtpunktet, og det syns jeg er litt... jeg vet ikke, det er veldig lite sånn som det her i hvert fall, at det legger opp til at vi skal være kritisk og at det legger opp til at vi skal gjøre opp våres egne meninger, utfra resonneringer, fordi at vi leser jo sjelden de stykker vi hører om, vi leser om dem i bøker, vi leser sjelden stykkene for å gjøre opp våres</p>	<p>2. S explains that in the theoretical subjects they have no opportunity to form a standpoint, as the textbooks present the information in such a way that leaves no room for own judgements. S states thus that in order to examine the information presented, one needs access to the original sources, something which does not occur.</p>	

<p>egne meninger om dem liksom, vil bli aldri oppfordret å være kritisk til de der store forfatterne og sånn her, det er veldig ofte sånn at vi bare får beskjed om at sånn skrev de og sånn skrev de og de var veldig flink og de var ikke så populær og liksom sånn der. Hvis folk hadde skrevet så pompøst om litteraturen etter 1950 liksom, så tror jeg at...og vi skulle ha lest det nå så tror jeg at vi hadde tenkt å herregud, hva er det her slags nasjonalisme!</p>		
<p>3. F: Kunne du kanskje gi meg et eksempel av kritisk tenkning i forbindelse med dramafaget? E: I drama blir vi jo, skriver vi logg da, fra timene... F: Hva er det? E: Vi skriver referat nesten fra alle teaterproduksjonstimer vi har, det er 10 timer i uka da skal vi skrive referat fra de timene. Da legger de veldig stort vekt på at vi skal reflektere over det vi har gjort, sånn at vi får beskjed om vi skal fortelle om de forskjellige ting at vi har gjort, og beskrive øvelser og sånn, og skal vi skrive litt om hvorfor vi gjør dem og hva vi fikk ut av det, og hvordan, hva vi lærte av det kanskje sånne dere ting.</p>	<p>3. S states that critical thinking includes contemplation over the working process and explanation of the process; means used, the way it was carried out and what was learnt.</p>	<p>3-5 S states critical thinking involves elaboration of the working process, method and means used, and evaluation of the results achieved. S feels that extensive training in this evaluation process might lead to the overshadowing of the positive sides of one's work, something that S considers destructive.</p>
<p>4. kritisk...jeg syns det som kan være kanskje kritisk tenkning i drama må kanskje være at vi gir kritikk til hverandre når vi gjør ting, at vi greier å lære oss å se hva som kunne har vært gjort bedre</p>	<p>4. S specifies critical thinking includes evaluating one's work aiming at discovering how the results can be improved. This process includes both negative and positive appraisals.</p>	

<p>liksom. Fordi at når vi for eksempel jobber med prosjekter så sitter de som ikke er med på scenen å se på og gir kritikk på det som bli gjort liksom, både positiv og negativ, eller og da... blir vi på en måte oppøvd til å bli kritisk til teater,</p>		
<p>5. men det blir nesten sånn at det blir litt ekstremt fordi at nå er jeg sånn at jeg ikke kan se teater lenger...fordi at det blir helt ødelagt sånn at vi bare ser de negative tingene til og med profesjonelle teater og ser du bare dårlige ting, greier ikke å syns det er bra liksom...</p>	<p>5. S feels too much training in such an evaluation can have adverse effects, i.e. to concentrate in discovering only the negative sides of one's work.</p>	
<p>6. F: Så gir læreren din anledning inne i klasserom for å vise fram kritisk tenkning? E: Ja, i drama gjør de mye av det. Det er jo nesten, i år har det vært det nesten hele tiden ...eller det virket som det er der de har laget hovedvekten, faktisk, i år, at vi skal greie å se kritisk på det, på vår egne prosjekter... F: Mener du å evaluere, eller... E: Hmm...eller...ja, men også underveis liksom, mens vi jobber med det, så er det også sånn at vi hele tida blir presset på å at vi kan gjøre ting bedre hele tida liksom...</p>	<p>6. S states they demonstrate critical thinking by a) continuously evaluating their work and b) finding ways to improve the work while carrying it out.</p>	<p>6-7 S feels she receives adequate training in identifying the negative sides of one's work and how to improve it, mainly by following the teacher's suggestions. S considers this evaluation a manifestation of critical thinking.</p>
<p>7. F: Men gir læreren noen tips på hvordan å gjøre det, hvordan vet du hvordan å gjøre det? E: Ja, hele klassen har jo lært utrolig mye på akkurat det punktet der i år, i begynnelsen var vi ikke noe flink til det i</p>	<p>7. S explains they receive a lot of effective training with how to discover the negative points of one's work. This has mainly been done by observing the teachers pointing out the parts one could improve.</p>	

<p>det hele tatt, i begynnelsen var det ingen som greide, altså vi har jo lært...jeg vet ikke helt...de har i hvert fall greide å lære oss hva vi skal se etter, ikke sant, at hvis du hadde gjort det sånn og sånn så ville det har vært bedre, så vi greier å finne ut hvordan ting gjøres feil, og det greide ikke vi i begynnelsen og det merker jeg i hvert fall for meg selv at jeg har lært utrolig mye på det, akkurat det.</p>		
<p>8. F: Så hvis vi tenker litt på eksamen og prøver og sånn, hvordan må du lese på en effektiv måte for å ha en vellykket eksamen? E: Jeg tror nok egentlig at det er flere måter å gjøre det på, jeg tror nok at du vil kunne oppnå å få en god karakter på en muntlig eksamen, også på en skriftlig egentlig, men i hvert fall på en muntlig, bare ved å lese det som står i boken og å kunne det. Hvis du kan det og forstår det, men jeg tror nok at det også vil være en grei måte, jeg i hvert fall blir få mer utbytte av det hvis jeg hadde greid å lese det, og forstå det, og være kritisk til det, og så at jeg greier å kunne trekke inn andre ting og greier kanskje å gjøre meg opp meninger som ikke står i boka, ikke sant...Og kanskje, hvis at man får muntlig eksamen kan diskutere det som står i boka, faktisk, trekke inn nye ting, så tror jeg det ville være 6'er tingen liksom, jeg tror nok det ville være det som skiller 5</p>	<p>8. S states that even though more knowledge of the learning material is adequate to pass the exams, she finds it more constructive and effective (for the exams) to study the material and examine it under the light of external, additional information and to form personal meanings about it.</p>	<p>8-9 S adopts a studying method that involves elaboration of the learning material in relation to additional information sources, which S acquires even though it is not an exam requirement.</p>

<p>eller 6-eren at du faktisk kan å trekke inn nye ting og ikke bare sluke det som står i bøkene og som er med i pensum. Jeg tror nok at det er sånn, jeg håper i hvert fall, og sånn er den erfaringen jeg har fra eksamen, så har det vært sånn. At hvis at man kan lære, jeg leser veldig godt merker til det på de fagene der jeg virkelig kan gjøre det, der jeg greier det, så får jeg mye bedre karakterer. Og der er liksom, kan pensum, men ikke noe ut over pensum, så får jeg en 5er. Men hvis du kan nok ut over pensum, hvis du greier å imponere, du må liksom kunne noe ekstra for å få en 6eren. Det merker jeg veldig godt med muntlig eksamen og sånn. Men at det gjelder ikke så mye på skriftlig.</p>		
<p>9. F: Har du kanskje noen metode på hvordan å behandle stoffet? E: Jeg har vel egentlig, jeg har en far som er veldig flink til veldig mye som kan veldig mye historie og kan veldig mye om fredsforskning og masse sånne ting, som jeg får merke at jeg får veldig god bruk for. Så jeg bruker ham mye da. Hvis at jeg skulle lese til eksamen, så bruker jeg han veldig mye, ikke egentlig drama, for det kan han ikke så mye om, men sånn i fag som han kan mye om så er det kjempe fordel fordi at...da kan jeg legge vekt på å kunne ting ut over stoffet, fordi at han kan det som står i bøker men han kan også mye mer, han kan, han er ikke så</p>	<p>9. S explains she uses other sources of information (outside the textbooks) in order to get more perspective on the learning material.</p>	

<p>innsnevret som bøker må være liksom...</p> <p>F: Så mener du at du bruker han som informasjonskilde, eller...</p> <p>E: Ja...</p>		
<p>10. så, sånn er det, studieteknikkene mine er egentlig sånn som jeg bare har gjort...i ungdomsskole var jeg veldig flink, og det flyter jeg på enda, fordi jeg har lært meg på en måte...jeg kan bare lese gjennom ting og huske det veldig lett, sånn at hvis jeg leser konsentrert gjennom 20 sider 3 ganger, så kan jeg det.</p>	<p>10. S states her current ability in memorising effectively is built on previous good school performance and high levels of concentration.</p>	
<p>11. Og da er det veldig greit for meg å kunne bruke faren min som, å bare fortelle om det jeg har lest om, og så sier han OK, men det kan også være sånn og sånn, og så kan han fylle inn det som jeg har lest i bøker.</p>	<p>11. S states she gathers information on the learning material from other sources.</p>	
<p>12. F: Og gir kanskje læreren din noen tips?</p> <p>E: Jeg synes vi får veldig lite, vi fikk jo litt i første, eller jeg gikk ikke på skolen her i det første, men vi fikk jo litt på ungdomsskolen, tips som hvordan man skal lære studieteknikkene, men jeg tror egentlig, det er veldig individuelt, jeg tror egentlig...jeg brukte aldri det som bevisst i hvert fall, det som vi lærte, eller det som de gav beskjed om sånn kan være lurt å gjøre og sånn kan være lurt å gjøre, jeg brukte aldri bevisst.</p>	<p>12. S explains she learnt about studying techniques earlier in her schooling, and observes that she makes no use of them intentionally and systematically.</p>	<p>12-14 Due to previous experience, S considers consistent work the most essential method for having effective results; she does not make intentional and systematic use of specific studying techniques. S also believes that since the subjects she follows are of a practical character, studying techniques are actually not necessary.</p>
<p>13. Men jeg har foreldre som er veldig</p>	<p>13. S stresses that previous schooling</p>	

<p>flink til å passe på at man gjør ting på skolen, og særlig på ungdomsskolen, var det sånt, og når de da 'pushet' på å jeg gjorde ting jevnt så har jeg merket at det er det som teller, fordi at hvis du jobber jevnt, så lærer du deg ting mye fortere, da greier du liksom å henge inn med. For min del...hvis jeg skal begynne ikke å jobbe i 2 måneder så jeg skal ta inn alt det, så blir det så mye stress at jeg greier ikke å lære meg noe...</p>	<p>experience has shown her that for effective results, she has to work consistently.</p>	
<p>14. F: Så hvis du ber læreren om hjelp, med dette her, hva kan læreren gjøre? E: Med studieteknikker? F: Ja. E: Det har jeg egentlig ikke gjort i år da, men sånn som i dramaet, for eksempel, så er det veldig spesielt, fordi at der er det ikke bøker som du...vi har bøker, men det er ikke lagt opp til at vi må lese i de bøkene, det er helt frivillig liksom. Så det er arbeidet vi gjør med, for eksempel, å lære oss skuespillerteknikker, å komme inn i rolle, og uttrykk på scenen og utstråling og sånn, det lærer jo vi gjennom praktisk, trening, og når vi spør lærerne da, så får vi jo tilbagemeldingen...de går gjennom...</p>	<p>14. S explains that when knowledge is acquired in a practical way, studying techniques are unnecessary.</p>	
<p>15. Jeg syns egentlig vi har ikke, jeg tror ikke det er så mye i pensum i år da, men jeg tror det kommer mer til neste år. Men vi har lært litt om teoretiske ting, vi har lært litt om Stanislavski og Brecht og</p>	<p>15. S explains they prioritise practice over theory, because of time limitations.</p>	<p>15-16 S observes the teacher prioritises practice over theory, due to time limitations. This is experienced negatively by S, as she needs a theoretical explanation of the things they</p>

<p>Penka og sånn, men det er veldig lite, så gjør vi det heller, vi lærer ikke teorien, vi bare lærer det i praksis liksom. Og den er sikkert på grunn av tid da, at vi ikke har tid til å gå gjennom det teoretiske...</p>		<p>carry out in practice.</p>
<p>16. Men det er mer som, det er litt vanskelig å sette fingeren på hvordan vi lærer det, fordi at vi gjør det liksom, og når vi da får så lite teoretisk tilbakemelding på hvorfor vi gjør det, så er det litt vanskelig å kunne... du må nesten sette deg ned og lese det selv, hvis du skal skjønne helt hva det er som skjer, ikke sant, hvorfor du lærer det og hvorfor det fungerer, det lærer vi ikke. Det synes jeg egentlig er litt dumt, det er litt sånn sviakt, men jeg tror at kanskje vi skal ha mer om til neste år. Men det savner jeg egentlig litt i år, at de ikke går litt nøyere gjennom det om hva som skjer, hvorfor vi gjør ting, fordi at de ting vi må å gjøre praktisk får vi ikke så mye forklaring på.</p>	<p>16. S feels a lack of a theoretical explanation from the teacher of what they carry out in practice; it is up to her to study the learning material and try to find out how things work.</p>	

AA (FEMALE)

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det noen ting om kritisk skjønn...hva er kritisk tenkning egentlig? E: Jeg tror at kritisk tenkning går mye på det å ikke svelge ting uten å tenke over dem på en måte, når du lærer noe, sånn i skole</p> <p>2. fordi at...vi bruker jo lærebøker og det er mye som er skrevet ut i fra læreplanen, men også det er jo ikke at en lærebok viser det korrekte bildet har vært mulig. Altså vi har for eksempel i bok eldre historie som på en måte unnlatt å ta med enkelte ting men tar med andre ting som ikke nevner noe om enkelte deler av historie og sånt ja,</p> <p>3. så jeg tror på en måte det dreier seg litt om rett og slett å ta inn informasjon og på en måte bearbeide, å prøve å koble noe med andre ting altså du vet om tema og så ikke står og aksepterer at lærerne og læreboka har absolutte svaret på alt...Det tror jeg er kritisk tenkning.</p> <p>4. F: Kunne du kanskje gi meg et eksempel i forbindelse med fransk? E: Ja, gjelder det fortsatt kritisk tenkning? F: Ja, ja. E: Det er litt vanskelig egentlig, fordi at når det gjelder språkfaget så har det på en måte ikke så mye lagt vekt på kritisk</p>	<p>1. S states that critical thinking embraces the intellectual examination of the things one learns before accepting them.</p> <p>2. S states that the textbooks do not include either the correct or all the information regarding knowledge.</p> <p>3. S says that critical thinking includes examining the information presented by the school learning sources (i.e. textbooks and teachers) in contrast to the extant personal knowledge and other information sources.</p> <p>4. S states that critical thinking is not applicable on subjects that one lacks previous knowledge about.</p>	<p>1-3 S indicates that critical thinking includes examining the information presented by various learning sources before accepting them; personal knowledge and additional informational sources are necessary.</p> <p>4-5 S observes that critical thinking requires previous knowledge on the subject, and thus she cannot apply it while learning something totally new.</p>

<p>tenkning...også du er der og så lærer du et helt nytt språk, og det her er noe som du ikke kan noe om i det hele tatt fra før, og dermed så er det veldig vanskelig å være kritisk, i forhold til språk.</p>		
<p>5. F: Så mener du at kritisk tenkning er begrenset, avhengig av hvilket fag du tar, eller...</p> <p>E: Ja, til dels også...det har jo sånne fag som på en måte, er mer språkfag og så har du realistiske fag som er mer matematikk og sånn der og så har du en som er sosiologisk eller humanitære fag som kanskje var samfunnslære og historie og sånne fag da. Språkfag, hvis du er helt fersk i et språkfag, og på en måte bare skal lære språket helt elementære, så tror jeg ikke du er opptatt av så veldig mye kritisk tenkning fordi at der er du rett og slett avhengig av hva, man må bare forstå og klare å snakke og det er noe som læreren kan lære deg liksom. Når det gjelder sånne realistiske fag, sånn som matematikk og sånn, så enkelte ting må du bare akseptere, men det betyr ikke at du skal svare dem blindt, og så...greit nok at du må akseptere egentlig elementære bestemmelser, men...for eksempel i matematikken, hvorfor et tall opphøyd i nullte det blir 1, ikke sant, og det akter ikke å akseptere uten å på en måte få vite grunnen til det. Og det fikk jeg på en måte å vite når jeg spurte læreren, sant...</p>	<p>5. S explains that critical thinking is more applicable on school subjects of a theoretical character where—even though one has to accept without further consideration some principal ideas- one can learn the background of these ideas before accepting them. S contrasts this to the subjects where the aim is to learn something totally new; one cannot demonstrate critical thinking here, as the teacher is the one who holds the necessary knowledge.</p>	

<p>6. så det gjelder å være litt kritisk på det område også, når det gjelder realistiske fag, også når det gjelder noen slags sosialistiske eller sosiologiske og humanitære fag, så kan en være kritisk i henhold til at det her er rett og slett fag eller emner som bygger veldig mye på teorier som forskjellige mennesker har lagt fram, og dermed kan du være mye mer sånn individuelt kritisk i at du kan selv trekke egne resonneringer, og være kritisk på den måten.</p>	<p>6. S explains that one can be critical at theoretical subjects because they comprise of theoretical constructions, which one can intellectually examine and form an opinion about.</p>	
<p>7. F: Så gir læreren din anledning til å vise kritisk tenkning inne i klasserom? E: Mener du språk eller generelt? F: Ja...du bestemmer det. E: Ja, jeg mener i hvert fall den læreren som vi har nå gir veldig ...vi har jo litt forskjellige da. Vi har jo for eksempel en lærer som på en måte mest gir poeng, pluss poeng for sånne der rene fakta opplysninger fra boka, og det blir for dumt igjen syns jeg, fordi at en hver kan sti opp en fakta opplysning uten å tenke seg to ganger, ikke sant! F: Hvilket fag snakker du om? E: Geografi, blant annet.</p>	<p>7. S states that some teachers rate high the mere reproduction of the information given in the textbooks, something that S thinks does not demonstrate intellectual analysis and examination.</p>	<p>7-8 S observes that not all the teachers give the opportunity to the students to intellectually analyse the information given, and to produce own judgements, as they rather give weight to pure reproduction of knowledge.</p>
<p>8. Men for eksempel i sånn som når det gjelder samfunnslære og eldre historie der er det med mye mer åpenhet også fra lærerens sida, at elevene, bedømmer ting kritisk eller...at de i hvert fall resonnerer så er det ikke noe som er kritisk på trass,</p>	<p>8. S states that other teachers give space to the students to intellectually examine and ponder over the learning material, with the expectation to justify their opinion.</p>	

<p>over materialet de blir presentert med. Men at de tenker mer selv, resonnerer og så at de kommer med grunnen til kritikken sin og ikke bare tenke: ”jeg tror ikke noe på det”, for eksempel.</p>		
<p>9. F: Kunne du gi meg et konkret eksempel kanskje for å forstå litt bedre hva du mener? E: Det har litt med årsak og virkning å gjøre, for eksempel, jeg kan ta norgeshistorie, for eksempel, også hvorfor Norge var i en nedgangsperiode altså rundt 1500-1600 tallet, at det på en måte kan ha noe med svartedauden for eksempel å gjøre og at ting skjedd der og at folketallet gikk ned og så å se sammenhengen, tydelige sammenhenger ikke bare sånn som historieboka peker dem ut men også kunne påpeke andre sammenhenger her og der.</p>	<p>9. S explains that a way to demonstrate critical thinking is to make various connections among the learning material in order to find out the reasons and consequences of various given facts.</p>	
<p>10. F: Så mener du at læreren ber deg om å tenke på denne sammenhengen? E: Ja, altså læreren men at læreren åpner for at elevene gjør det...det tror jeg egentlig er enda viktigere, ikke noe nødvendig at læreren står der og gjør det, men at elevene også deltar i læringen, at du har litt mer sånn eierforhold til læringen din.</p>	<p>10. S states that the teacher gives the opportunity to students to perform intellectual analysis, which S characterises as a way for students to participate actively in their own education.</p>	<p>10-11 S feels control over her education when she has the opportunity to intellectually analyse and come to own judgements, something that takes place under group discussion.</p>
<p>11. F: Men har din lærer vist deg hvordan å anvende din kritisk tenkning? E: Vi har en veldig muntlig undervisningsform på en måte som går</p>	<p>11. S states that the way the lesson takes place in the theoretical subjects allows the students - through group discussion- to come to conclusions themselves about the subject; this in</p>	

<p>mye på diskusjon i klassen, i hvert fall i fag som eldre historie og samfunnslære, har vi det. Også i norsk for eksempel, der har vi det. Og det går jo på at alle kan være mye mer med i en diskusjon rundt temaet og at folk kan komme med egne meninger og innspill, som kan føre til konklusjoner i klasserommet, ikke bare at læreren holder foredrag eller at vi leser læreboka.</p>	<p>contrast to the situation where the students get information by the school learning sources only.</p>	
<p>12. F: Så læreren gir deg ikke noen tips for eksempel om hvordan å gjennomføre denne prosessen? E: Nei, og så sann er prosessorientert arbeidsmåte mener du sånn kvalitetssirkel...? F: Ja, jeg vet ikke.. E: Du har jo for eksempel den der bedrifta bruker jo mye den der kvalitetssirkelen, også i prosjektsammenheng for eksempel som er da å se, tenke, planlegge, gjennomføre, det der som bedriften kaller kvalitetssirkelen, hvor at, på en måte, de mener har blitt sånn som må nå har blitt tatt i skolene som ofte at læreren ser, tenker og planlegger, og så at elevene gjør... F: Så du får noen linjer... E: Ja, du får på en måte en linje at elevene blir passiv, veldig passiv i undervisningsformen,</p>	<p>12. S explains that the usual way to work at school is that the teacher executes most of the learning process phases, i.e. ponders, plans and executes, whereas the students have only a passive role, to carry out what the teacher decides.</p>	<p>12-14 S indicates that her school promotes students' active participation in the learning process, i.e. pondering, planning and execution. S specifies this active participation takes place also during some type of exam, something that she experiences very positively.</p>
<p>13. Men det tror jeg, jeg tror Alfa videregående, tror jeg er en skole som er</p>	<p>13. S states that in contrast, her school involves the students in all these phases of the learning</p>	

<p>veldig flink til å ta med elevene i hele prosessen. Det vises jo også gjennom alle de små prosjektene vi har, hele tida i alle mulige fag, hvor elevene selv skal se, tenke, planlegge og gjennomføre også se på nytt igjen på en måte så blir ikke på en måte en kvalitetspiral, det blir en sånn utviklingspiral på en måte...Ja...nå glemte jeg hva jeg skulle si...</p>	<p>process.</p>	
<p>14. F: Hvis vi tenker litt på eksamen, hvordan kan du ha en vellykket eksamen, eller prøve? E: Det er veldig vanskelig fordi at...altså hvordan du skal bedømme læringen mener du? Bedømme måloppnåelse? F: Hvordan kan du forberede seg til det? E: Jeg kan ta et eksempel, for eksempel vi har tentamens dager eller skrive dager for eksempel i et fag som norsk, hvor vi har...altså sånn som da jeg gikk på ungdomsskole så var det hver satt på sin pult, vi fikk skrive oppgaven, det var forbudt å snakke med andre. Skriv en stil. Mens nå så har vi sånn der: vi kan velge oppgave, så har vi ide- myldring, åpent, og så klokka 9.15 for eksempel skal det være stilt i klasserommet. Men det kan for eksempel enda ta med folk på gangen og snakke og få respons og få dem til å lese gjennom, så du kan på en måte utvikle ditt eget arbeid og få andres innspill på det og. Så det blir en mer sånn der istedenfor at du selv på en måte bare sitter ned og er</p>	<p>14. S explains that in a specific test- type in theoretical subjects, the students have the opportunity to choose the assignment, develop their ideas and discuss them with others, in contrast to the earlier school years where this process was more restricted. S experiences this as very positive.</p>	

<p>tvunget til å gjøre noe. Det syns jeg er veldig positiv at du får lov til å gjøre sånt der i skrive dager i hvert fall.</p>		
<p>15. F: ...hva med i forbindelse med prøve... E: Ja, altså prøve blir litt vanskeligere for at i andre...norsk er jo et fag som åpner deg fordi at den kreative skrivingen er på en måte som skal bedømmes, men altså har du et annet fag, et hvilket som helst annet fag, så er det på en måte mye mer sånn der fakta opplysinger og sånn...også i for eksempel sånn der historie og sånn der, så er det jo mye resonnering og sånt som skal til også men det er jo også en del fakta opplysinger, har du fått med deg enkelte ting i historie, hvorfor dem har skjedd, hvordan det har ført til det og sånn, sånt ja...</p>	<p>15. S explains that for the exams which take place during the year the object of evaluation is creativity in writing in some subjects, whereas in others it is also mere knowledge of established information.</p>	
<p>16. og det kan jo være en gunstig grei å ha i et gruppearbeid, egentlig...men jeg tror også man må ha prøver og individuelle prøver for å rett og slett på en måte bedømme hvordan den enkelte elev for eksempel har klart stått fram med det.</p>	<p>16. S states that in order for assessment to be complete, each student should be evaluated individually on handling the material, in addition to the evaluation out of group-work.</p>	
<p>17. Det kan jo være vanskelig i sånn der realistiske fag, på en måte hvor at...det går rett og slett veldig mye på fakta, men det kan jo også hjelpe på en måte folk å få med seg sånn og sånn,</p>	<p>17. S states that this type of evaluation is not always possible at subjects where mere knowledge of information is central. S thinks the latter has both positive and negative sides.</p>	
<p>18. så jeg tror ikke det som bør i hvert fall forandre seg ikke er nødvendigvis læringsmetoder, men...jo, det og,</p>	<p>18. S states the currently used learning methods do not make her feel attached to her education at a high degree.</p>	

<p>selvfølgelig, å gjøre dem mer sånn er sosiale, å gjøre at elevene mye mer har tilhørighet til undervisningen sin,</p> <p>19. men også å forandre bedømmingen av læring, hva slags karakter greien, fordi at jeg mener at veldig ofte så er ikke karakteren gitt uti fra måloppnåelse fra læreplanen, men uti fra på en måte hvor mye fagkunnskap en elev bare kunne spytte ut.</p>	<p>19. S says that the evaluation of learning needs to be directed not to the amount of knowledge the students can reproduce –as it is often being done- but to the level the students have achieved the goals presented in the curriculum.</p>	
<p>20. F: Har læreren vist deg hvordan å lese på en effektiv måte? Når du har en bok du må gå gjennom, hvordan vet du hvordan du må lese effektivt?</p> <p>E: Det som blir det er at du må tilpasse lesningen etter hver enkelt, hvordan du merker at hver enkelt lærer bedømmer deg.</p>	<p>20. S says that efficient studying amounts to adaptation with the teacher regarding the object of evaluation.</p>	<p>20-22 S observes high grades are essential to one's future, independent of the knowledge gained, and thus while studying, she gives more emphasis to what the teacher considers important.</p>
<p>21. Også det for eksempel var gjort en undersøkelse, jeg var på sånn der seminar, hvor at fylkeskommune, divisjonsutdanning hadde kalt sammen folk fra andre skoler, å snakke om skolevurdering. Også var det noen for eksempel som hadde...laget en undersøkelse, om hvor viktig elevene mente karakterene var. Alle mente at karakterene var viktig eller meget viktig, men så hadde ikke de tenkt grunnen hvorfor sier de at karakterene viktig eller meget viktig, jo fordi at karakterene bestemmer veien deres videre, om de kommer inn på det og det studiet, om de</p>	<p>21. S states that because of the great importance the school grades have for one's future, the purpose of going to school becomes to achieve high grades and not to gain knowledge.</p>	

<p>kommer på den skolen, hva jeg vil bli videre i livet, det der bestemmes av hvor bra karakterer du får. Følgelig, blir på en måte en stor fokus av det å gå på skole blir ikke imot faktisk tilegning av kunnskap, men det blir mot å oppnå de karakterene du vet er viktig for å komme deg videre. Altså det blir en slags ond sirkel ut av det.</p>		
<p>22. Og det som skjer på en måte det er at...jeg merker at jeg har lest på en annen måte nå enn det jeg gjorde før, for jeg tilpassa meg mye mer læreren. Altså når jeg leser historie, for eksempel, så klarer jeg å så lese i boka, og så klarer jeg å understreke det viktige uti fra det jeg vet læreren min kommer til å bedømme er viktig. Men i et annet fag for eksempel i geografi, så vet jeg at der kommer læreren til å bedømme etter fakta opplysninger har å komme med. Og dermed så leser jeg på det, ikke sant, ja. Så det har mye mer med individuell tilpassing i henhold til lærerne å gjøre, tror jeg.</p>	<p>22. S says her way of studying has been lately directed more to adapting to each teacher's preferences, i.e. she gives emphasis to the points the teacher believes are important.</p>	
<p>23. F: Men du sa noe om understreking...har du noen annen måte å lese på? E: Ja...også...det spørs jo helt da, ja.</p>	<p>23. S says she uses underlying of the essential points as a method to study.</p>	
<p>24. Det der er jo hvis du faktisk skal ha en skriftlig prøve i et fag, men hvem sier at det er nødvendigvis rette metoden å måle læring på.</p>	<p>24. S questions the methods the school uses to evaluate learning, i.e. use of written assignments.</p>	
<p>25. Skolen her har for eksempel et prosjekt gående, som heter 'modul 2000',</p>	<p>25. S explains that the students –under a special school programme- choose the goal of the</p>	<p>25-26 S feels she is strongly engaged in her learning when she has the</p>

<p>hvor at elevene setter seg ned altså de har 8 sånn derre læringsenheter, og i en hver enhet så er det tema, for eksempel natur. Og så setter de seg ned med læreplanen og stryker under, og finner ut hvilke mål dem kan finne på for det her tema, og hvilket fag dem kan knytte opp mot det her tema, og gjør et prosjektarbeid og så... bedømme det selv, bedømme andre, lærere bedømmer dem, dem bedømmer læreren, og så får dem karakterer ut fra måloppnåelse. Og så mener dem at demselv mye mer får en tilhørighet til sin egen undervisning.</p>	<p>subjects, plan the lessons and evaluate themselves out of the chosen goal; this evaluation is a co-evaluation with the teachers. S says that in this way the students feel they actually participate in their education.</p>	<p>opportunity to actively participate in the learning process. Nevertheless, S indicates that this is achievable only when the amount of subjects that need to be covered is restricted.</p>
<p>26. Men det er noe som har vært veldig vanskelig å på en måte gjennomføre på allmenfag med så mye forskjellige studieretningsfag og så mye små fag, to timers fag, så der må man nok gå, fremdeles etter ting som lærebøker og sånn...</p>	<p>26. S says that this way of carrying out learning is not applicable when there is a big number of subjects that need to be covered.</p>	
<p>27. Det spørs jo også hvordan det forskjellige...for å gå litt mer sånn psykologisk til grunn så er det forskjellige typer hukommelse mennesker har opp i da, noen har den billedlige på en måte, at dem husker at det står der og de kan si hvor på sida opplysninger stod. Mens andre har mer sånn der resonnerende, som på en måte får med seg hovedtrekkene, og skjønner at det er sånn og sånn og sånn og kan etterpå gå ut i fra det. Det er veldig store individuelle forskjeller på hvordan</p>	<p>27. S states that the way one studies depends on the way one remembers things i.e. either memorise visually the information on the book or isolate the main points.</p>	

<p>du leser.</p> <p>28. F: Men har læreren gitt noen tips som dette her, som understreking...</p> <p>E: Vi hadde jo...æsj, vi hadde en sånn der person som kom inn i førsteklassene... studieteknikk, det var grunnkurset i studieteknikk, rett og slett. Men det dreide seg om det å lage tankekart og sånn for eksempel, og gå uti fra et tema og la ting ut fra det og på en måte, resonnere på den måten.</p> <p>F: Så det er ikke hver enkel lærer som sier disse ting, det var bare en person som kom inn...</p> <p>E: Ja, han er jo lærer her på skolen da, så det er ikke noe sånt,</p>	<p>28. S says the students were given information about some studying methods (e.g. thinking cards, intellectual analysis) once.</p>	
<p>29. men jeg tror det er at det presset som ligger på lærerne må komme gjennom den spesifikke fagplanen men ikke bare det...jeg tror mye lærere tenker over at de må komme gjennom den spesifikke boka, som de har valgt til fagplanen. Og dermed, så blir det sånn pass lite tid at de rekker på en måte ikke å hjelpe hver spesielle person med teknikker for å oppnå på en måte for å tilegne seg kunnskap da, det tror jeg blir vanskelig rett og slett.</p>	<p>29. S says it is unmanageable for each teacher to give individual help to the students regarding studying methods during the usual classroom time, because their main concern is to go through the textbooks and learning material they have chosen within a restricted time.</p>	<p>29-30 S observes students receive help on studying techniques only when asked it individually, outside the time frames of a lesson. S feels the teachers' priority is to cover the learning material, due to the time pressure.</p>
<p>30. F: Så hvis du går til læreren og ber om hjelp, hva kan læreren gjøre?</p> <p>E: Hvis du går selv og spør læreren om hjelp, så tror jeg absolutt at du får hjelp, til</p>	<p>30. S states the way to receive information about how to study is to ask help from the teacher individually, since then the teacher can evaluate the students on a more personal basis.</p>	

<p>for eksempel hvordan du kan lese og sånn. For da kan læreren på en måte bedømme deg som person og ikke klassen som enhet, så hvis du sier jeg har problemer med det og det, jeg har problemer med å trekke ut hovedpunkter for eksempel, hvordan, hva skal jeg gjøre, hvordan mener du jeg kan gjøre det, da tror jeg at læreren absolutt kan hjelpe deg mye mer, fordi at læreren er jo...også de jobber med folk hele tida...</p>		
<p>31. F: Har du opplevd dette selv, eller... E: Nei, jeg har aldri...jeg har bare vært sånn der person som ikke gidder å henge i ordentlig og så på en måte lese litt dagen før prøven, og så får en femmer liksom, det går greit. Ikke det at kunnskapen sitter så lenge, nødvendigvis holder nå til prøven altså...</p>	<p>31. S states she does not make proper efforts for her learning and does not aim at high grades; she explains that the knowledge she acquires is not long-lasting.</p>	

AA (MALE)

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det ganske mye om kritisk skjønn. Hva er kritisk tenkning? Hva betyr det? E: Kritisk tenking? Nei...å kanskje ikke ta alt det du lærer for god fisk! Stille spørsmål til det du lærer...</p>	<p>1. S says that critical thinking embraces setting under examination information given before accepting it.</p>	<p>1-2 S considers it difficult to demonstrate critical thinking at a subject of a pragmatic character, as the intellectual examination required is not possible.</p>
<p>2. F: Kunne du kanskje tenke på et konkret eksempel, fra fransk, kanskje... E: Det er, i fransk og kanskje litt...med språk er det jo enten eller sånn, så vet ikke hvordan en kan være kritisk til franskfaget...</p>	<p>2. S expresses difficulties in explaining how demonstration of critical thinking can be achieved during the learning of something totally new (i.e. language) since the nature of this subject (pragmatic character) gives no room for alternatives.</p>	
<p>3. men måten du lærer på kan jo være kritisk. F: Hva mener du med det? E: Ja, hvis du mener at læreren kanskje har en feil måte å lære bort på og ikke får noe, og føler at du ikke får noe utbytte av det så ville det være kritisk da...</p>	<p>3. S explains that 'critical' is also directed to the teaching method, as one can evaluate the way the teacher instructs, in relation to whether one benefits from it or not.</p>	
<p>4. men det kunne også... du må også gjøre innsats selv også, at du må vise innsikt i faget før du kan vise deg kritisk til det, du kan ikke bare avfeie det og ikke lære deg noen og droppe ut fra undervisning...</p>	<p>4. S says that in order for one to be critical within a subject, personal effort to understand it and acquire knowledge for is required.</p>	<p>4-5 S explains that critical thinking involves intellectual examination and exchange of ideas about an issue that one has interest in and knowledge about.</p>
<p>5. men du tenker på kritisk i forhold til måte å lære på, eller...fag, eller? F: Du vet det, jeg vet ikke...kunne du fortelle meg, hva forstår du med 'kritisk tenkning' inne i klasserom? E: Nei...i hvert fall å stille spørsmål, hvis du...altså du kan lese noen ting og så må,</p>	<p>5. S explains that critical thinking embraces setting under examination the information you get, by first acquiring relevant material, and then communicating with the teacher in order to clarify things.</p>	

<p>bør egentlig jeg mener at du bør stille spørsmålet ved det fordi de først kan du bruke læreren fullt ut så han kan svare på spørsmål du lurer på selv, etter å ha fått inn liksom grunn informasjon. Og hvis du finner svake punkter eller så må du spørre om det liksom.</p>		
<p>6. F: Gir læreren din –jeg snakker om fransk- anledning til å vise kritisk tenkning inne i klasserom? E: Ja...det gjør han...og vi tar også i emner sånn...ofte så skriver vi logga, eller når vi hadde prosjekter og sånn, skrive log om hvordan det gikk og hva vi syntes –bra dårlig- og...vi har hadde også sånn før jul så hadde vi sånn...da vi skal skrive hva vi synes har vært bra eller dårlig i løpet av hele skoleåret. F: Mener du å evaluere ditt eget arbeid, eller... E: Ja, evaluere, hvordan det har vært hvordan med klassemiljø, hva læreren har gjort, hva du har gjort...</p>	<p>6. S says that the students demonstrate critical thinking by keeping a working journal where they evaluate their work, the teacher and the classroom environment throughout the whole year.</p>	
<p>7. men...jeg er ikke noen sånn stjerne elev akkurat i fransk, så det gjør at akkurat i det faget er det vanskelig for meg å være oppriktig kritisk...så... jeg godtar mere enn jeg kanskje burde gjort. F: Hvorfor sier du det, mener du at de elevene som er flinkere er bedre i kritisk tenkning? E: Ja, og så elevene som i hvert fall har interesse for fransk...</p>	<p>7. S states that in order for one to demonstrate critical thinking, competence and interest in the subject are required.</p>	<p>7-8 S indicates that demonstration of critical thinking requires competence in, personal interest in and knowledge about the subject.</p>

<p>8. F: Så mener du at kritisk tenkning, du må ha en interesse i... E: At du må ha grunnlag...for å uttale...være imot det likesom...så må du vite noen om det...</p>	<p>8. S explains that in order to demonstrate critical thinking, some knowledge foundation is necessary, so that one can respond to the given information.</p>	
<p>9. F: Men har læreren din vist deg hvordan å tenke på en kritisk måte? Gir han noen tips kanskje, eller... E: Tenker du på franskfaget da? F: Nei, ikke nødvendigvis. E: Jeg vet ikke, har i hvert fall fått inntrykket at jeg ikke kan forholde meg kritisk til franskfaget...for eksempel til engelsk. Der vet jeg mye mer selv, og så læreren...ja, ofte sånn det er jo den rollen for engelsklæreren og elevene, at ofte er det ikke sjelden at elevene vet mer enn læreren, men i fransk så...ja, det kan jo være lett å...å være kritisk hele tida, det kan jo skape litt negativ stemning i klassen...</p>	<p>9. S states that sometimes the students possess more knowledge than the teacher on the subject; this can lead to a situation where the students object to the teacher quite often, something that can create negative feelings.</p>	<p>9-10 S observes that some teachers encourage discussions during the class. This is experienced partly negatively by S, as the students often are in opposition to the teacher.</p>
<p>10. og noen lærere oppmuntre til at du skal si det du mener og uansett...</p>	<p>10. S says that some teachers gladly give the opportunity to the students to express their opinion.</p>	
<p>11. F: OK, hvis du tenker på engelsk da, kan du gi meg et eksempel på kritisk tenkning inne i klasserom? E: Det er vanskelig...du tenker, læreren skal lære bort noe til elevene, så det er enten språklig grammatisk eller...og så det er jo læreren følger jo så ...ville jo bare passe at regler for hvordan en engelsk setning skal skrives</p>	<p>11. S explains that at a subject of a pragmatic character (i.e. new language), one does not have the opportunity to demonstrate critical thinking, as one only has to ensure that established rules are followed.</p>	<p>11-13 S observes that subjects of a pragmatic character ask for application of specific rules, where intellectual examination -and thus critical thinking does not take place. S believes that in this case, the core curriculum is not applied.</p>

<p>12. og læreplanen slik jeg har forstått legger opp til det skal læres videre til elevene gjennom læreren og sånne ting,</p> <p>13. da finner jeg det egentlig vanskelig å være kritisk, om du skal ha presens –s i tredje person likesom...</p>	<p>12. S observes that the core curriculum illustrates that the knowledge should be further formed by the students with the help of the teacher; in the case of this subject of a pragmatic character, this is not applicable.</p> <p>13. S does not have the opportunity to examine the information given at this subject of a pragmatic character, as pure examination of the application of the established rules does not qualify for that.</p>	
<p>14. men i fag som samfunnsfag, i fag der du kan diskutere, der er det lett å være kritisk. F: Hvordan da? E: Om hendelser i historien om...kanskje læreren tar en standpunkt, politisk standpunkt som du kanskje er uenig i, da blir det ofte diskusjon da. F: Så kritisk tenkning er å diskutere også mellom dere, eller... E: Ja,</p>	<p>14. S explains that demonstration of critical thinking is easier made in subjects which give the chance for discussion to take place, as the students can contrast their opinion to the teacher's.</p>	<p>14-15 S believes that discussions between the students and the teacher about both various statements and the instruction process, are manifestations of critical thinking.</p>
<p>15. men det skulle også... men... ja... hvis læreren skal lære bort grammatikk, hvordan det skal formuleres setninger og sånn, og du hører at du ikke får utbytte det, så vil gjerne andre i klasserommet som får utbyttet det...så er det altså spørsmål om du skal trække fram og si at nei, nei, det er feil, at det her kanskje ikke gjøre, men det er også andre folk som er forsiktede som mener at det var helt fint, så en må ta det opp med hele klassen først, eller...hva en skal gjøre, men...stort sett</p>	<p>15. S says that critical thinking consists also in expressing one's opinion about the way the teaching takes place and discussing with the class whether it is beneficial or not.</p>	

<p>sier elevene fra hvis undervisningsopplegget går helt galt.</p> <p>16. F: Og hvis vi tenker litt på eksamen, hva må du gjøre for å ha en vellykket eksamen? Hvordan kan du forberede seg på en riktig måte?</p> <p>E: Tenker du på sånn emner, fransk...prøver der, du har fått tildelt det materialet du skal lese, du kan jo begynne med å lese det du skal lese, og leser det du kan jo prøve å skrive opp hva som du mener er viktig av det du lest og så hvis du virkelig skal ut med det, så skal jo gå selvfølgelig til andre kilder enn læreboka og de sidene du far fått å lese siden da du også får andre syn på ting, elever har forskjellige syn. For når du har litt flere kilder så kan du reflektere over og skuldre forskjellige vinkler av en sak da blir straks en prøve eller besvarelse mye mer komplett, likesom.</p>	<p>16. S states that successful studying includes reading the learning material given and at the same time pointing out the most important parts; in addition, one should look for other information sources on the subject, so as to obtain a more integral picture of the subject.</p>	
<p>17. F: Gir læreren din noen tips, på hvordan å lese på en effektiv måte?</p> <p>E: Vi hadde jo en lærerinne som lærte oss studieteknikk.</p> <p>F: Hva er det?</p> <p>E: Lærte oss hvordan vi skal lage et...vi leser, først skal vi skumlese en gang i gjennom stoffet, så lage tankekart med runding av, bruk av tegninger osv. Fordi at, tips om å ta fra flere kilder, det har vi fått fra samfunnsfag læreren.</p>	<p>17. S says that they got information about various studying techniques (i.e. skim once through the text, point out the most important parts with the help of written illustrations) once. S states that the advice to seek for more information sources was given from a teacher different than the one who taught studying techniques.</p>	<p>17-19 The studying techniques S was trained in once consisted of skimming and isolating the main points. S observes that the teachers do not give further training on them, unless asked individually by the students.</p>
<p>18. F: Så det er ikke hver enkelt lærer som</p>	<p>18. S states that they had instruction on studying</p>	

<p>gir disse teknikkene, eller... E: Nei, nei...Det var en person, en lærer som gikk til alle klasser.</p>	<p>techniques only once.</p>	
<p>19. F: Så hvis du ber læreren om hjelp, hva kan læreren gjøre? E: Jo, han kan selvfølgelig hjelpe deg. De fleste han kan vel, og så vi har vel visse om allmenn studieteknikk, liksom at du skal lese flere ganger, og notere, og...</p>	<p>19. S says that most of the teachers give advice on how to study if asked, i.e. go through the material more than once, keep notes.</p>	
<p>20. F: Bruker du disse, eller? E: Ja, når prøver er viktige...eller jeg føler selv at der her bør jeg gjør bra, så setter jeg meg ned...det blir gjerne sent, en natta før....</p>	<p>20. S acknowledges that he makes use of studying techniques only when he finds the exams important and feels he has to perform well. S says that he prepares for the exams in the short period before.</p>	

SCHOOL 2

PRINCIPAL

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Først ville jeg vite hva du gjør for å sikre at disse målene er oppnådd her på skolen. R: Ja. Det som jeg har lest nå, det er ikke noe mål, det er ikke en målbeskrivelse for det første. Det står her noe om hva som skal inngå i opplæringa... F: Ja, det var det jeg mente, det var feil språkvalg... R: Ja.</p>	<p>1. S supports that the core curriculum includes a description of the content of the instruction, rather than specific goals.</p>	<p>1-2 S indicates the core curriculum contains not goals, but a description of what the instruction should contain, together with the qualifications the students are required to possess.</p>
<p>2. Uten at jeg tar igjen den teksten, så går det jo på -jeg skulle til å si- den måten, altså du spør om hvilken måte vi lærer opp elevene våres til å utvikle kritisk sans, til å vurdere selv, osv. F: Akkurat. R: Jeg kan komme tilbake lite grann til hvordan jeg ser akkurat på det, hvordan jeg kvalitetssikrer det i skolen våres, det kan jeg ta etterpå. Men først, ville jeg ta noe helt annet, som har akkurat med det her å gjøre. Fordi at en del av de tekstene og forventningene til elevene som ligger i det dokumentet der, den generelle delen av læreplanen og også i det dokumentet som går på det der med –hva heter det- det er et dokument som elevene skal</p>	<p>2. S states that the core curriculum poses various qualifications that the students should possess.</p>	

<p>bruke... Veiviseren, i Veiviseren så legges det veldig store forventninger og krav til hva elevene er i stand til å gjøre.</p> <p>3. Noe av det vi sliter aller mest med, det er akkurat det som er påpekt her. Jeg er på en god del ledermøter, og snakker med rektorer i fra andre videregående skoler. Vi er en veldig spesiell videregående skole, vi har kun bilfag, ikke noe annet. Og vi har møter sammen med elever fra andre videregående skoler bl.a. 'Anatolia Skolen', hvor vi har en helt annen elevgruppe enn vi har her, som på en måte er veldig mye mer, skal vi si, tenkende på den måten som her er beskrevet. Altså veldig kritisk, opptatt av måten å lære på osv.</p>	<p>3. S observes that compared to other schools of the same educational level, her students are qualitatively different concerning the way they make use of their mental capacity and the degree of school engagement.</p>	<p>3-4 S acknowledges that a large number of the students who attend the school are not particularly enthusiastic or engaged into school matters, due to their previous low school performance and learning/behaviour difficulties.</p>
<p>4. F: Så hvor ligger forskjellen? R: Forskjellen ligger i at når elevene går i ungdomsskolen, så er det noen som er det vi kaller for 'skoleflink' – jeg presiserer uttrykket 'skoleflink' og ikke flink, men skoleflink- og de skoleflinke elevene fortsetter i stor grad innenfor allmennfag. På skolen hos oss, så hadde vi inneværende år over 40% med elever med definerte lærevansker. Altså i form av lese- og skrivevansker, atferdsproblemer, fag osv. som de ikke har tatt, slik at innstillinga i forhold til det å gå på skole, motivasjon for å gå på skole den er veldig, veldig lav.</p>	<p>4. S explains that the students who attend the school without enthusiasm, have usually had previous low school performance and/or learning/behavioural difficulties. S specifies this is the case with a large number of her students.</p>	
<p>5. Og det er en ny situasjon for oss, etter</p>	<p>5. S explains this is a new experience for her, as</p>	<p>5-6 Discussing the low enthusiasm -for</p>

<p>reformen. Før reformen, så hadde vi også i gjennomsnitt to år eldre elever, men de var motivert for å gå her, og var interessert i å lære.</p>	<p>previously the students who attended the school showed enthusiasm and were engaged in the learning process.</p>	<p>participating in the central aspects of the learning process and for communicating with the teachers- that the students demonstrate, S observes that this situation emerged after the Reform 94.</p>
<p>6. I dag, bl.a. dette her med elevmedvirkning som er et satsingsområde innefor divisjon utdanning, for å få elevene aktivt med på planlegging av undervisninga, på gjennomføring av undervisninga også på vurderinga av seg selv. Det er et satsingsområde, og vi sliter for å få med elevene. Enkelte å si rett ut at planlegging av undervisninga, det orker de ikke, de må gå her på skolen for å være her. Og så har vi –men det er ikke alle elevene sånn- og så har vi en håndfull elever, i år så er det en lite håndfull elever som er aktiv i elevrådsarbeid bl.a. Jeg skulle til å si de tar en veldig stor byrde av liksom det som forventes av elevene i forhold til å være aktiv imot oss i ledelsen på skolen da, og imot lærerne. Så noe av det største problemet vår skole har fått etter reformen, er det å få</p>	<p>6. S states that after the Reform 94, the school has been facing serious difficulties in getting the students engaged in the learning process (i.e. the planning, execution and evaluation of instruction) and in debating with the personnel. S adds that most of the students do not actually manage to participate in the building up of the instruction.</p>	
<p>7. –det er jo hvilken uttrykk vi...Altså vi har veldig mye verksted, ikke sant, veldig mange lærere kommer ifra et verkstedmiljø, det er arbeidsfolk,</p>	<p>7. S remarks the instruction is carried out in a practical way at a high degree and that quite a lot of the teachers are not actually professional pedagogues.</p>	
<p>8. og det vanskeligste i dag, det er altså å sparke dem i baken. Altså, motivasjon, og liksom lysten, og det gjenspeiler seg også</p>	<p>8. S says that in order for the students to show interest in and willingness to engage in the learning process, enthusiasm to attend school is</p>	<p>8-9 S remarks that even though the school provides the students with the opportunity to actively participate in the</p>

<p>i forhold til det der å ta ansvar for sin egen læring, å være deltakende i undervisninga, å være interessert og få lov til å være med å bestemme.</p>	<p>first required; this is not the case with her students.</p>	<p>learning process, and take major decisions regarding the instruction, the students show a lack of interest for this kind of engagement.</p>
<p>9. Vi gir jo elevene våres en stor frihet i, altså lov til å være med og lage undervisninga, om dem vil være i verksted og lære seg det, eller om de vil være i teorirom og lære seg det. Men dem er likeglad i forhold til det. Nå snakker jeg om, skal vi si, en stor del av elevene våres.</p>	<p>9. S specifies that the students are given the opportunity to decide the way they prefer the instruction to be carried out (either in a theoretical or a more practical way), but a large number of them show a lack of interest to take advantage of this opportunity.</p>	
<p>10. F: Men jeg er ikke så sikker om jeg forstår noe riktig; hvorfor...altså elevene p.g.a. at de ikke er så 'skoleflinke' som du sa, så kan de ikke vise eller utøve kritisk sans. R: Jeg sier ikke at de ikke kan bli det. F: Nei, OK. R: Nei. Jeg sier ikke at de ikke kan bli det. Men dem har vært vant til å sitte på skolebenken gjennom veldig mange år og få veldig mye tatt imot, ikke sant. Altså hvis dem skal utøve en kritisk sans, gjør egne vurderinger, så må en være aktiv, det må foregå noe her [han viser til hodet sitt].</p>	<p>10. S states that elaboration of the information received and production of own judgements requires an active attitude from the student's side, which is counteracted by previous low school performance.</p>	
<p>11. Det avsnittet her, det kan jo passes på mange ting da, altså i forhold til, samme hva du driver med, vi prøver jo hver...når vi er i verksted med elevene og vi jobber med detaljer av sikkerhetsmessig karakter, så ønsker vi at dem skal være kritisk, vurdere hele tida. Slik at dem, skulle til å is, vurderer det dem selv gjør, ville han</p>	<p>11. S states the students are expected to examine carefully and consider the consequences of their actions under working performance.</p>	

<p>sende ut i en bil som mister hjulet bort uten her, -det har faktisk hendt en gang og det er ikke noe særlig - det gjelder i forhold til det arbeidet, arbeidet dem gjør da.</p>		
<p>12. Altså ønsker vi dem å også være kritisk i forhold til det tilbudet av opplæring som de får. Vi ønsker at dem skal være mer kritisk til det.</p>	<p>12. S states the students are expected to examine and evaluate the instruction they receive.</p>	
<p>13. Og det vi er rimelig sikker på, har noe med tidligere skolefortid å gjøre, fordi elevene som engasjerte seg i skolesamfunnet, som er kritisk, det er dem som, skulle til å si, også sånn vurderingsmessig har gjort de beste resultatene i ungdomsskolen. Så elever som, skulle til å si, har vært skoletapere i ungdomsskolen, dem sliter vanskelig med selvbildet sitt. Dem sliter voldsomt egentlig med bl.a. med fraværproblematikken, altså dem tar ikke ansvar for seg selv og det henger sammen med det der med de tingene som vi har her, ja, ikke direkte alt som står her da.</p>	<p>13. S states that achieving high school results is related to being active. Low school performance eludes negative thoughts and feelings about oneself and one's competence, which in turn influence the will to attend school, and the effort shown there.</p>	
<p>14. F: Men før du begynner å snakke litt om det, kunne du forklare litt mer hvorfor etter reformen 94 disse elevene som har mest problemer med å lære kom hit på skolen? R: Det kan jeg ikke forklare, nei. F: Fordi du sa at etter Reform 94 så begynte problemet. R: Det er voldsom stor forskjell. Vet du</p>	<p>14. S explains that after the Reform 94, due to the educational rules, those students who have learning difficulties and social disadvantages are prioritised in the school admittance.</p>	<p>14-16 Explaining the reason why the situation at school changed after the Reform 94, S indicates that due to educational rules, the school comprises of a large number of students who suffer from learning difficulties and thus are not qualified to apply the core curriculum.</p>

<p>hva en a-søker i videregående skole er?</p> <p>F: Nei, du må forklare det for meg.</p> <p>R: Inntak til videregående skole, det foregår i flere omganger. Den første februar så søker alle elever som har dokumenterte lærevansker, altså det er elever som har en sterk grad av lese- og skrivevansker, elever som har sosial bakgrunn som gjør at dem ikke kan søke på ordinært grunnlag, altså veldig mye elever som i utgangspunktet ikke vil ha kommet inn på skolen hvis dem hadde konkurrert på likelinje. Så dem søker den første februar. Og så er det en ordinær søknad på våren, hvor da, skal vi si, de resterende elever får plass. Fordi a-søkerne får plass først.</p> <p>F: Så de er prioritert...</p> <p>R: Dem kommer først da, og dem kan være dårligst kvalifisert. Før, så hadde vi en liten andel av de søkerne.</p>		
<p>15. På grunnkurs mekaniske fag i år, så har vi to klasser, og det er til sammen 24 elever. Det er 15 a-elever som søkte til oss. Det går ikke å ta inn alle, men 15 a-elever, det betyr elever som ikke skal gjennom læreplanen, i fullt monn fordi at dem har ikke forutsetninger, dem har vært fritak for fag i grunnskole osv.</p>	<p>15. S states that the majority of the students suffer from learning difficulties and thus does not possess the necessary qualifications and knowledge base required to achieve the goals posed by the curriculum.</p>	
<p>16. Slik at dem nærmest, og årsaken er to ting: for det første så nå integreres alle elevene, også dem som ikke har lyktes i ungdomsskolen, skal inn i videregående</p>	<p>16. S explains that due to educational rules, all the students have the right to enter the school programme, irrelevant of their previous low school performance; this is not a guarantee that</p>	

<p>skole og få en plass. Den typen elever fikk vi ikke før, fordi at dem måtte ha bestått for å komme til oss, sånn var det før. Men nå skal alle ha plass, men det er ikke sikkert at alle skal nå målet, det er ikke sikkert at alle skal ha full fagutdanning,</p>	<p>all will be able to fulfil their education.</p>	
<p>17. og en del av årsaken tror jeg til at vi får en langt, langt større andel av svake elever nå, det er de problemer egentlig som rådgiverne i ungdomsskolen har. Dem sitter ansikt til ansikt med en elev som har mislyktes i engelsk, har mislyktes i norsk kanskje og i matematikk. Hva skal han råde den eleven til? Skal han råde han til å ta allmennfag? Da er en rimelig sikker på at han kanskje kommer til å mislykkes siden og. Jeg vil råde dem til å ta mekaniske fag, for da får han lov til å skrue, ikke sant, og bil, det er spennende for ungdom.</p>	<p>17. S states that students with low previous school performance attend the school because they have been advised to do so, based on the assumption that a) the students will not be able to succeed in the theoretically oriented schools, and b) the subject of this school (car mechanics) is attractive to them.</p>	
<p>18. Så den gruppa vi har av elever som trenger noe særskilt, den er blitt så stor, at det på en måte, skal vi si, dominerer opplæringsmiljø da. Og derfor har vi ikke, skal vi si, i utgangspunktet mange av de elevene, skulle til å si, som vi tillegger skal vi si, de kvalitetene, de egenskapene som står i den generelle delen av læreplanen. Fordi her forventes det noe av elevene også, det er ikke bare at skolen skal gi elevene mulighet, og vi skal ikke bare utvikle eleven videre, men eleven må i utgangspunktet også være veldig</p>	<p>18. S observes the fulfilment of the curricula goals requires the presence of certain abilities, an attitude of interest, as well as a favourite school milieu. S acknowledges the majority of the students do not possess those characteristics, and thus cannot make use of the opportunities the school gives them.</p>	

<p>interessert. Må være litt kritisk, og den elevgruppa våres, den har blitt svakere i så måte, mye svakere enn tidligere.</p> <p>19. F: Så hvis vi går litt tilbake til dette her,</p> <p>R: Går vi tilbake til teksten, ja.</p> <p>F: Så hva kan du gjøre for å sikre, på den best mulig måte at denne er anvendt her på skolen?</p> <p>R: Jeg kan ta litt om teksten men også de mål vi lager, altså når vi bestemmer oss hva som er satsingsområde for liksom hva som vi skal satse på i det kommende år i forhold til opplæring. Bare så du liksom skjønner hvilket plan vi jobber med så er fraværproblematikken et satsingsområde på vår skole for å få elevene til å være på skolen, for å få dem til å komme. Vi kjører og henter dem om morgnen enkelte av dem, ikke sant. Skjønner du?</p>	<p>19. S states a major amount of effort is devoted into making the students attend the school.</p>	
<p>20. Men spørsmålet ditt gikk konkret på hva jeg gjør for å kvalitetssikre det her. Ved vår skole per i dag, så har vi en organisasjon som er slik at jeg ikke er ut i undervisninga. Overhodet ikke. Jeg, skulle til å is, leder skolen gjennom de fora hvor jeg treffer pedagogisk personale, og hvor jeg treffer avdelingslederne. Vi har tre avdelingsledere på undervisningsida, det er en på teknisk fagskole, vi har en på det vi kalt for VK2 før da, med det er mer læringer nå, og så har vi Pål Petersen som har den største avdelinga da på VK1. Vi</p>	<p>20. S states she is not directly in contact with the students, she rather communicates with the pedagogical and administrative staff, by discussing various sides of the instruction.</p>	<p>20-22 The control of whether the core curriculum is applied, is part of S's responsibility, who receives information on instructional issues by being in contact with the staff only, and not the students. Critical thinking has not been a concrete issue of discussion.</p>

<p>har avdelingsleder møte hver mandag, og der drøfter vi alle sider av opplæringa.</p> <p>21. Det her, har ikke vært fokus i noe stor grad på de møtene. Det er helt klart, det har ikke vært, det er ikke det som har vært prioritert for oss på de møtene.</p> <p>22. I tillegg, så har vi den kontakten jeg har direkte med lærerne, hvor jeg tar opp konkrete ting, det er noe vi kaller for ped-avdelingsmøter. Da har vi et felles møte for alle lærerne ifra alle avdelingene hvor vi diskuterer og reiser spørsmål. Men jeg er ikke inn i undervisninga og ser at det her blir varetatt. Det er gjennom den møtevirksomheten jeg har med lærerne.</p>		
<p>23. F: Men på dette møtet, f.e. har dette her kommet opp noen gang, eller...? R: Altså hvis du tenker på det der med som står på...altså at vi skal omfatte trening i å tenke, i å gjøre forestillinger, undersøke dem, begrepsmessig og trekke slutninger, altså å resonnerer osv. observasjoner og eksperimenter, altså det er det hele opplæringa egentlig går ut på, kan du si. Altså hvis de ikke har en evne til å så gjøre seg forestillinger og gjøre noe resonnementer i forhold til, men det er knyttet til det faglige, det er knyttet til det rent, rent faglige. F: Så mener du at dere forventer at elevene har denne evnen fra før? R: Nei, vi forventer ikke at dem har den, altså...for det her kan jo være i forhold til</p>	<p>21. S observes critical thinking is not a priority issue for discussion between her and the personnel.</p> <p>22. S states the way she can follow whether the application of the curriculum goals takes place is indirectly through the discussions on concrete instructional issues, with the teachers.</p>	
	<p>23. S states the underlying goal of training is directed toward making the students able to produce, examine and evaluate conjectures, in close relation to the school subjects.</p>	

<p>samfunnsspørsmål, det kan være i forhold til fagspørsmål, ikke sant.</p>	<p>24. Jeg skal ta å bruke et eksempel for at det er mulig at vi misforstår hverandre. En elev, skal f.e. regne ut volumet av den her koppen [viser til en vanlig kaffekopp]</p>	<p>24. S declares she will give an example on critical thinking. S explains the student has to solve an assignment which consists of making a judgement regarding the property of an item, which the student is familiar with.</p>	
<p>25. og så får han 300 liter, ikke sant, da får han 300 liter. Da syns vi at vi som lærere har mislyktes, fordi at det er greit nok å regne ut 300 liter i en sånn kopp, det betyr ikke noe for det er bare et tall; men det at dem ikke forstår at det ikke går 300 liter opp i her, det har noe med liksom hans evne til å tenke og resonnere selv. Og det er jo den måten vi tenker på innenfor fagene, at når vi gjør en ting, enten i et matematikkstykke, eller om det er et håndverk ut i verkstedet, så skal vi få dem til å prøve å tenke logisk i forhold til det de gjør, og trekke slutninger selv, og ikke ta alt på gitt altså.</p>	<p>25. S indicates the student comes with an answer that is impossible to be correct, for it is inconsistent with the item's features as found in reality. S considers the teacher has failed in training the student at this instance, not because the student did not know how to execute the calculations involved correctly, but because s/he was not able to realise the above inconsistency. S underlines this kind of process is expected by the students, in all the subjects; meaning they should be able to actively examine the information acquired in relation to personal knowledge and experience and thus come to own judgements.</p>	<p>25. S considers the student's training a failure, when the answer given is in total discrepancy with everyday reality, when the student is not able to use personal knowledge and experience in order to make this comparison. S indicates the students are expected to make such connections and comparisons in all the school subjects, so as to examine the information given in an active way and thus produce own judgements.</p>	
<p>26. F: Så hva slags mulighet gir lærerne til elevene for å gjøre det? du kan gjerne bruke et konkret eksempel hvis du vil. R: Jeg vet ikke om jeg kunne gi deg et eksempel på hvilken muligheter...fordi at som jeg sa at alle opplæring går jo på å få elevene til å selv gjør vurderinger av...og jeg må relatere det her til for eksempel verksted hvor absolutt mest av opplæringa foregår. Tenk deg når en bil kommer på et</p>	<p>26. S states the underlying aim of the instruction is to make the students capable of using their subject knowledge so as to mentally examine the indicative information they receive, and discover a solution to work problems.</p>		

<p>verksted. Det vi ønsker at elevene skal være flink til med når de er ferdig til oss, det er at når de snakker med en kunde, så får de en del begrep, en kunde kunne si at "OK, det er noe som ramlar når jeg kjører i 30 mil/time". Målet våres er at eleven etter at å ha snakket med kunden, når han begynner på en bil, er i stand til å bruke fagkunnskapen sin til selv å gjøre en vurdering av hva er det som er feil med den bilen her, ikke sant. Altså det å evne å bruke den kunnskapen han har til å resonere i forhold til det han holder på med... Men jeg har ikke noe svar på det, altså for alle opplæringa går på det; det er målet det! Det står i fag-spesifikke læreplanene også, så står, er jo det egentlig en del av de fleste målene det, at elevene skal kunne utføre forskjellige ting, ikke sant.</p>		
<p>27. F: Ja, men du svarte faktisk, det jeg mente var på hvilken anledning kan elevene vise kritisk tenking? Og du sa dette med kunden, for eksempel, så den er måten...</p> <p>R: For det er liksom hele målet det, altså en ting er den fagkunnskapen vi skal fylle på med, du kan fylle på med veldig mye fagkunnskap, men hvis de ikke er i stand til å omsette den fagkunnskapen til selv å bruke den til kritisk tenking til å dra slutninger, så har de ikke bruk for den fagkunnskapen. Det er feil å si at de ikke</p>	<p>27. S states the aim with the students' training is to enable them to use the subject-knowledge acquired, in order to evaluate work situations and come to own assessments and produce own judgements.</p>	

<p>har bruk for, men de får ikke nyttig gjort seg av de forskjellige fagkunnskaper.</p>	<p>28. Og det er klart det er sånn som...det er kanskje dumt å snakke om bil da, men det er jo tross alt det vi driver opplæring på, og en bil, den er sammensatt av mange forskjellige systemer –du har elektriske systemer, hydrauliske systemer, du har mekaniske systemer- og alle de systemer de virker i et samvirke, så det er klart jo at skulle til å si, en tilstand i en del, i et system, det fører til noe ting i et annet system, fordi at, og det er klart, det ønsker vi at elevene skal være i stand til å finne ut da.</p>	<p>28. S explains that the discovery of the source of a work-related problem requires knowledge about both the various parts the working object consists of individually, and the various ways in which they are connected together. The identification of the malfunction involves elaboration of the extant indications in a synthesised manner.</p>	
<p>29. Og vi får gjentatt det, gjentatte ganger, høre i fra bransjen som vi utdanner folk til, at det vanskeligste og viktigste området er blitt med moderne teknikk, det er feilsøking. I det begrepet så ligger det underforstått, en god feilsøker, han er veldig flink til å trekke egne slutninger til å bruke fagkunnskapen sin og til å tenke kritisk.</p>	<p>29. S states the most demanding part of their work is discovering the malfunction on the working object, which requires use of one's subject-knowledge and production of own judgements.</p>		
<p>30. F: Så hvordan trener de på det, mens de får opplæringa.... R: Ja, så de trener jo på den måten at de får, altså de har en mer problem-basert læring, hvor de får oppgaver, altså læreren sier ikke til eleven det at "OK, nå skal du skru av det hjulet der, og så skal du ta av den bremseklaven der, og så skal du skifte", men eleven får en jobb, hvor det er</p>	<p>30. S explains the students receive working assignments where they should identify on their own the malfunction on the working object and the way to proceed with it; this process includes elaboration of indicative information.</p>	<p>30-31. S indicates that the students carry out working assignments of an elaboration degree that corresponds to their level of experience and knowledge. S specifies the students are eventually expected to identify both the malfunction on the working object and its treatment, by elaborating indicative information.</p>	

<p>et aller annet feilindikasjon og så skal han selv prøve å komme fram til det, hva som han skal gjøre. Så du kan si at målet,</p>		
<p>31. altså vi starter ikke sånn med elever, når vi skal gi dem det helt grunnleggende, så gjør vi ikke sånn. Men når han begynner å jobbe på egne kjøretøy til verksted, så kan kunden stå ut i gården her og så si til han at "bilen min trekker til venstre, ikke sant, når jeg bremses". Og da er det jo eleven som er nødt til å finne ut hva som er problemet,</p>	<p>31. S specifies the degree of difficulty the working assignments have (i.e. degree of information the student is required to elaborate) increases as the students receive more experience and knowledge.</p>	
<p>32. læreren skal ikke fortelle det til han. Men læreren er jo til stede til en hver tid sånn at han kan veilede, og at han kan spørre læreren.</p>	<p>32. S states the teachers do not give direct answers to the students on how to deal with work-related problems, but are always available so as to provide help and guidance when needed.</p>	
<p>33. Men i det hele tatt, skal vi si, reparasjon er svært ofte en problem-basert læring. Fordi at svaret ligger i dagen da, altså det er ikke sikkert at læreren kan fortelle svaret eller, fordi i dag så er det sånt at skulle til å is, det skjer såpass mye nytt, at heller ikke læreren til en hver tid har oversikt.</p>	<p>33. S explains the working object demands that every malfunction has to be evaluated in relation to the extant surrounding factors; a standard, pre-determined solution does not exist, also due to the fast development of the components and systems operating in the object.</p>	
<p>34. F: OK, så la oss ta dette eksempel, at det kommer en bil og den har et problem, og elev må finne ut hva som er galt. Hvordan kan læreren sikre at eleven viser, bruker kritisk tenking til det? R: Hva er det du mener med 'sikre'? F: Hvordan kan de sjekke at eleven bruker</p>	<p>34. S states that without use of critical thinking one cannot properly take the necessary action to deal with working problems.</p>	<p>34-36 S supports that critical thinking is essential to the elaboration of a working problem. Nevertheless, its demonstration by the students depends on the level of knowledge and experience they have with the working object, which in turn guides the kind of assignments they</p>

<p>kritisk tenkning? R: Altså hvordan bruker kritisk tenkning, altså det vil jo ganske fort, avdekke seg, i forhold til den type jobben, fordi at en elev som ikke er i noe særlig utstrekning(er i stand til det, han vil bli stående der, han vil ikke få gjort noe særlig.</p>		<p>receive. The latter differ in the degree of elaboration required.</p>
<p>35. Så det vil jo, men det er klart at her vil være en progresjon i det her ifra læreren sin sida, fordi i starten av skoleåret, kanskje særlig de som ikke har noe greie på bilen, da blir dem ledet ganske skal vi si, kraftig i forhold til hva de skal gjøre, får beskjed om å gjøre det og det og det. Men det avtar, og så blir jobbene mer komplisert, etter hvert.</p>	<p>35. S specifies the complexity of work demands posed to the students, i.e. the responsibility the students assume in taking various decisions independently, depends on their degree of experience with the working object.</p>	
<p>36. For det er klart at vi tar inn oppgaver til elevene, eller gir dem oppgaver som skulle til å si er begrenset hva av dem liksom trenger å ha, skal vi si hvilke emner trenger i forhold til det med kritisk tenkning i begynnelsen av skoleåret, men ettersom de kommer lenge på skoleåret, så får dem et større ansvar i forhold til en større del av en jobb som kommer. Så jeg vet ikke om det er svar på spørsmålet ditt, men...</p>	<p>36. S explains the type of working assignments the students get depends on the students' qualifications; as the students become more experienced, they are responsible for more of the phases involved in the execution of the work assignments.</p>	
<p>37. F: Så når, hvis de står fast, hva er lærerens rolle da? R: Lærerens rolle i første rekke, altså hvis du tenker på elever som begynner å komme, begynner å nå målet etterhvert, i</p>	<p>37. S states the teachers guide the students through the working process by indicating information sources, working tools or working methods.</p>	

<p>andre halvdel av skoleåret, så er lærerens jobb først og fremst å veilede i forhold til hjelpemidler som elever kan bruke for å selv komme fram til målet. Ikke å fortelle dem hva resultatet er. Han kan gi en tips om, det kan være i form av hvor kan han finne opplysninger f.e., eller hvilke metoder han kan bruke for å finne ut feil på bil, men ikke å gjøre det for han.</p>		
<p>38. Altså med det å veilede eleven i å komme fram og finne ut årsaken til noe selv, og det er egentlig en ganske stor tilfredstillelse det, hvis du får en mekaniker, i hvert fall de første ganger. Når du snakker med en kunde, å så sier han, egentlig hører noe rart, ellers så...ellers så oppfører bilen seg rart og hvis dem klarer å finne fram hva det er selv, og foreslå for kunden hva han skal gjøre, så det er en ganske OK følelse. Så det blir, er jo det vi vil da.</p>	<p>38. S states that the students' success in identifying a malfunction on the working object and suggesting a solution, is a very satisfying process for the teachers.</p>	
<p>39. F: Akkurat. Så hvis vi snakker litt om noe annet, det er vel relatert med dette her...det er en ting å gjøre noe praktisk, og det er en annen ting, for å ha en vellykket læring, eleven må vite først og fremst hvordan å behandle læringsstoffet, hvordan å lese effektivt, ikke sant. Så hvordan kan lærerne hjelpe med det? R: På hvordan dem... F: På hvilke måte vet elevene hvordan å lese effektivt. R: Ja. Hvis du tenker på teori, altså vi har</p>	<p>39. S says that after the Reform 94 the instruction of pure theory is limited to the absolutely essential.</p>	

<p>jo både allmennfag og vi har både...har studieretningsfag. For vår elevgruppe så har vi etter reformen siden 1994, kommet til den nesten helt entydig konklusjon at teori, der vi kan slutte med den, så skal vi slutte med den.</p>		
<p>40. For det å få inn de læringsmålene som står i våre fagspesifikke læreplaner, for det er dem de skal prøves, og må huske på det, den læreplanen her skal ikke etterprøves i det hele tatt, de får ikke karakter i det der, ikke sant, og det er heller ikke med til eksamen. Så det er de fagspesifikke målene,</p>	<p>40. S states that the fulfilment of the exam goals, which are included in the specific syllabuses, is prioritised; the instruction is accordingly accommodated.</p>	
<p>41. og vi har i minst mulig utstrekning teori etterhvert. Fordi at vi nettopp vet at det er så mange elever som ikke får med seg det de leser.</p>	<p>41. S says that due to the fact that a large number of students faces difficulties with reading comprehension, the school has limited the theoretical material to the absolutely essential.</p>	
<p>42. Vi kjører noen sånne kort kurs, som studieteknikk med elevene på våren. F: Kan du forklare det litt, hva det består av... R: Ja, det er hvordan dem skal gå gjennom en tekst. For poenget med oss for å gå gjennom en tekst, det er ikke skulle til å si, på en måte i de fleste fagene nå snakker jeg ikke om skjønnlitteratur, nå snakker jeg ikke om rettskrivning og i matematikk og sånt noe, men det mesteparten av det de har behov for å lære og de vi skal lære dem å lese, det er det som står i</p>	<p>42. S states that the studying techniques the students are trained with are harmonised with the demands they will later face in the working-life. Thus, the students receive some short training in how to comprehend a subject-related text.</p>	<p>42-44. S indicates that the studying techniques the students are trained in, enable comprehension of a text which contains subject-related issues, so that the student can use it while working in practice. S adds that it is up to the individual teacher to carry out this training.</p>

<p>verkstedhåndbøker. Fordi det er det de skal møte når de kommer ut på verksted.</p> <p>43. Og det som vi da prøver å få dem til å forstå, det er hva inneholder et lite avsnitt, altså de får lese et lite avsnitt som da enten er beskrivelse av en tilstand på en bil, eller beskrivelse av en slitasje, altså det er en beskrivelse av en teknisk ting. Det som vi ofte gjør for dem, det er at når dem leser gjennom sånne avsnitt, så får vi dem til i ettertid selv og så fortelle hva er det du har lest nå.</p>		
<p>44. Noen har det ikke så godt for å forklare seg, egentlig, få dem til å tenke, hva er det dette avsnittet viser. På samme måte som når de skriver da, så det er ikke så viktig for oss hverken rettskrivningen deres, eller ikke hvordan håndskrivningen er. Men det er dette med forståelse som vi legger stor vekt på. At de skal forstå det de leser for å omsette til det de skal jobbe med mer praktisk. Vi kjører ikke noe, altså utover det som den enkelte lærer gir til elevene, så har vi ikke noe spesielle opplegg utover en sånn kort innføring i noe studieteknikk på høst da.</p>	<p>43. S specifies the students are trained in extracting the meaning from a text containing information on work-related issues. This process includes reading through the text and then expressing its meaning.</p> <p>44. S emphasises that the aim of the instruction is the successful use of the theory into practice. Accordingly, the goal of the studying techniques is to manage to extract the meaning from the written material, so that it can be used while working in practice. S specifies it is left to the individual teachers to take up the instruction of studying techniques.</p>	
<p>45. F: Så det er studieteknikk kurs. R: Nei, det er ikke noe kurs, det er bare noen timer på høsten. F: I begynnelse, eller... R: I begynnelse, ja. Dess færre timer vi sitter sammen med elever på pulten, dess bedre er det. Utgangspunktet våres er at vi</p>	<p>45. S states the main way students are educated is through the use of praxis; theory is considered a helping means.</p>	<p>45-46. S explains that since the main goal is to make the students capable of performing a working task, instruction prioritises practice over theory.</p>

<p>skal jobbe med det praktiske, og så går vi inni teorierommet når vi har behov for det. Til neste år, så kommer vi også til å flytte en del av allmennfag delvis ut til verkstedet.</p>		
<p>46. F: Ja, det var dette med studieteknikkene, hvordan lærer elevene å lese... R: Ja, jeg kan ikke svare noe annet på det. Lesing er ikke det viktigste for oss. For de fleste målene i læreplanen går på å utføre ting, det er ikke så viktig at du skal fortelle, men det er viktig at du kan gjøre det. Det er det som er de fleste målene. Vi har hatt stumme elever her hos oss, så, ja, ikke sant og dem som faktisk er så ordblind at de ikke kan lese, så hvis vi kan lære dem på den praktiske måten, så egentlig det er det viktig for oss.</p>	<p>46. S explains the goal of the instruction is to make students capable of performing a working task, and therefore reading is not essential; learning through practice is preferred.</p>	
<p>47. Noe spesielle tiltak i forhold til elevene utover den enkelte lærer, det gjør vi ikke. Vi hadde en undersøkelse bare for å sette ut litt perspektiv, hvor mye tid våres elever bruker på lekselesing, våre elever bruker i gjennomsnitt fra null til en halv time i uka på lekselesing, for de leser svært lite leker. Det er en del som leser en god del mer i perioder før prøver og sånt da, det er det. Men som gjennomsnitt, det syns jeg for så vidt, når elevene har en lang arbeidsdag -de begynner kl. åtte og er ferdig kl. halv fire, det er jo en vanlig arbeidsdag- hvis de gjør jobbene sine i</p>	<p>47. S observes that on a regular basis the students spend a rather small amount of their time on studying. S feels this is due to the demands posed by the schooldays regarding the students' level of performance.</p>	

løpet av den tida, så klarer dem å komme i mål, når de ikke har så veldig mye om kvelden...		
---	--	--

TEACHERS

TEACHER 1

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Hvordan forstår du disse 2 formålene i forbindelse med ditt fag? L: Det er jo en opprømsing over måten vi gjør ting på da, og følger opp da med og det bygger på erfaringen og gjennom trening, øvelse, og diskusjon at vi kommer fram til felles forståelse.</p>	<p>1. S explains that based on experience, practice and discussion they reach a common understanding.</p>	<p>1-2 S indicates that 'critical judgement' is interpreted into common understanding which is achieved through discussion, with practice and experience.</p>
<p>2. F: Hva med kritisk skjønn? Hva betyr det? L: Det at vi diskuterer og får inn forskjellige elementer som vi vurderer og prøver å komme fram til...enes om felles forståelse.</p>	<p>2. S says that critical thinking includes reaching a common understanding through discussion, by evaluating various factors.</p>	
<p>3. F: Hva gjør du som lærer for å anvende disse formålene i din klasse? L: Vi bruker en del praktiske øvelser, bl. a. at vi først kjører teori, så kjører vi praksis, sånn for å oppleve det en får i teori i praksis i etter tid, så en får en bekræftelse på den teorien som vi har kommet fram til, i fellesskap og så blir da bekræftet i praksis. F: Og hvor kommer kritisk tenking i dette bildet? L: Kritisk tenking kommer ut kanskje mest fram i praksis, for de har fått teorien og fått en del opplevelser i form av teori,</p>	<p>3. S says that critical thinking is applied in the classroom through the experience the students get with theory and practice; the latter functions as a verification of what has been said theoretically, and it is in this procedure that critical thinking is mostly manifested. S explains that critical thinking is found in the process of discovering various ways to reach the same result through practice.</p>	

<p>da får de igjen å bekrefte ting og gjennom den seansen kan du også bli litt kritisk i gjennomføringen. F: Hvordan det? L: Det at de kan få se forskjellige måter å gjøre ting på, å løse oppgavene på forskjellige måter kanskje likevel komme fram til felles eller til samme resultater gjennom forskjellige øvinger.</p>		
<p>4. F: Hvordan vet elevene hvordan å bruke sin kritiske tenking? L: Det er å gå gjennom prosessen med den læringsprosessen og at de opplærte å være kritisk da til alt de får av lærestoff. Det ville jeg tro er ting som er gjennomført i fra grunnskole, og til videregående.</p>	<p>4. S states that the students have learnt how to apply critical thinking on the learning material during the earlier school years through the learning process.</p>	
<p>5. F: Hvis det er noen elever som har vanskelighet med å gjøre det, hav kan du som lærer hjelpe med? L: Vi kan hjelpe dem i form av spesiell undervisning, at de da får tilrettelagt litt bedre, får kanskje andre hjelpemidler, får også to-lærer system –slik at det er flere lærere som hjelper i samme klassen, får da å få med alle, det er forskjellige ståsted, og forskjellige bakgrunn på forskjellige elever.</p>	<p>5. S says that the teachers can assist the students in adjusting to this process (i.e. critical thinking) by using special learning techniques -i.e. having more than one teachers in the classroom or other types of learning means- so that the differences existing among the students can be dealt with.</p>	
<p>6. F: Når det gjelder måte å lære ting på, viser du til elevene hvordan å lære på en vellykket måte? L: Vellykket måte er, det er evaluering vi tar ettertid, på selve prosessen i teori-</p>	<p>6. S says that successful learning depends on how well the transition between theory and practice went.</p>	

<p>praksis,</p> <p>7. og evaluerer ettertid og får da også høre elevens synspunkt, hva mener de om den læringsformen som vi driver da. Og de da får anledning til å være kritisk og gjennom det å lære ting.</p> <p>8. F: Har du noen spesiell måte på å hjelpe elevene til det? Til å lære seg hvordan å lære på en vellykket måte?</p> <p>L: Det går jo på den å jobbe hver for seg og så da jobbe i grupper, det går ofte at det går automatisk at elevene trekker sammen 2 og 2 og hjelper hverandre. Det er erfaringsmessig så er det en god læringsmåte. Erfaring, å trekke den sterke eleven får vist sine evner, ved gjennom da kanskje å hjelpe til den svakere eleven. Den svake drar nytte av det moisatte.</p>	<p>7. S explains that the students manifest critical thinking by assessing the learning process and the learning techniques used.</p> <p>8. S explains that in order to learn successfully, one has to: work first alone; then work in groups and watch a proficient student-model perform.</p>	
--	---	--

TEACHER 2

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Hvordan forstår du disse to formålene i forbindelse med ditt fag? L: Det kan jo helt klart, vinkles opp imot nettopp det her, for det de gutter her da forhåpentligvis skal til det å bli bilmekanikere. Og da vil jo det her med å kunne resonnerer, både uti fra de observasjonene og de problemstillingene som ligger til grunn, så skal de da måtte kunne resonnerer seg fram til å at nå må jeg gjøre sånn og sånn, for å få ting til å fungere, reparere det som skal repareres.</p>	<p>1. S states that the students should be able to intellectually analyse and come to conclusions about how they should proceed with their work in practice, after inspection and according to the nature of the problem.</p>	
<p>2. Så det er klart, det siste her, det går sammen med å uttrykke seg klart, i argumentasjon, drøfting og bevisføring. Det er jo vinklet helt opp imot de samtalene med bileier, kunde. Så det ligger jo midt i bunnen av det vi holder på med,</p>	<p>2. S explains that 'expressing oneself concisely –in argument, disputation and demonstration' is relevant at a large degree to this subject area, as it refers to the discussion they have with the customers.</p>	
<p>3. og jeg har jo en litt spesiell klasse i år med sånne såkalte A-søkere, som har spesifikke og generelle læreversker. Og da er det jo kanskje nettopp det her i opp trening ikke minst det å kunne resonnerer seg fram til ting, det ligger mye trening på det område der.</p>	<p>3. S explains that the students need a lot of exercise with this intellectual analysis, as they suffer from learning difficulties.</p>	
<p>4. F: Og hva med det kritiske skjønnet? L: Dess jo mer erfaring de får, jo bedre er de i stand til å utøve det kritiske skjønn, at de er i stand til det i dag? det er ikke så</p>	<p>4. S states that critical thinking requires experience, and most of the students are not able to demonstrate it.</p>	

<p>mange av dem som er i stand, det tror jeg ikke. Men når de får få holdt på det, 5. og sånn som jeg har lagt opp mye av undervisningen i år, når det gjelder det her såkalte studieretningsfaget, så kjører vi en blanding av teori og praksis, sånn at de på en måte får veldig mye av praksis in gjennom fingrene. Og det er i hvert fall tilbakemelding som vi har fått så langt, så fungerer det mye bedre enn i rein teori undervisning, for den klassen her vil jeg merke. Så det blir kanskje på en mer form for modul undervisning det man driver med, det er første gangen vi prøver det, så det blir spennende, hvor vi hevner, det vet jeg ikke..</p>		
<p>6. Så det vil jeg nok tror da, at etterhvert som de får holde på, kanskje feile litt og gjøre tabber, dess større evne til å utvise litt sånn kritisk skjønn vil de kunne være i stand til.</p>	<p>5. S explains that her lessons consist of an exchange between theory and practice, something that seems to give better results than teaching purely at a theoretical level.</p>	<p>6-8 S indicates that 'critical judgement' includes making the correct decision regarding working problems, after taking into consideration all the factors involved. Even though the students have the opportunity to manifest critical thinking while assessing the working problems on their own, this is not done to a satisfactory level, as they lack the experience required.</p>
<p>7. F: Så hva betyr kritisk tenking? L: Det må jo være å finne de riktige løsninger i de gitte situasjoner, og likedan selvfølgelig overfor kunden, i samarbeid med kunde kanskje. Nå tenker jeg rein bilsituasjon...</p>	<p>6. S states that when the students have had more experience, they will be able to demonstrate critical thinking.</p>	
<p>8. F: Hva gjør du som lærer for å anvende kritisk tenking i klassen din?</p>	<p>7. S says that critical thinking includes discovering the correct solution within the situation constraints and according to the customer's standpoint.</p>	<p>8. S states that the students manifest critical thinking as they are given the opportunity to</p>

<p>L: At de får lov til å undersøke ting på egen hånd, jobbe, gjøre feil, gjøre tabber, for er det noe du lærer av, så er det dem, og det er kanskje dem du husker på; de ganger det går bra, så husker du ingenting. Og at de kanskje i ordets helt riktige betydning, de blir ikke trent så enormt mye akkurat i det her med det kritiske skjønnet, men de blir i alle fall gitt mulighet til å kunne vurdere uti fra sitt ståsted, om hvordan ting er, og at de får lov til å prøve å finne ut av det på egen hånd.</p>	<p>assess given situations and find the solution on their own, by making mistakes and thus learning.</p>	
<p>9. F: Hva om noen elever har vanskeligheter med å gjøre hva du nettopp sa. Hvordan kan du hjelpe? L: Det går mye på det her å ta vedkommende med seg og mer for seg selv, fordi i og med jeg har den klassen så har jeg da støtte i praksis del, vi er to lærere hele tida, så da får vi litt mer tid til den enkelte elev da, sånn at vi kan gå inn og bidra og hjelpe til litt mer på forskjellige områder da, så det er jo å prøve med å prate med dem å prøve å få dem til å bruke hodet og innsida, ikke sant..</p>	<p>9. S explains that students who face problems in demonstrating critical thinking can be given individual help with learning how to thinking independently.</p>	
<p>10. Jeg har ikke noe sånn eksakt papir jeg kan legge fram på hvordan jeg gjør det, nei. Det vil jo være litt situasjons betinget,</p>	<p>10. S says that the way she can help the students depends on each situation.</p>	
<p>11. men akkurat det her, som sagt, jeg med to-læreres systemet så har vi mye mer tid. Og boka sier jo ting på sin måte, jeg sier ting på min måte, og så kan vi jo</p>	<p>11. S explains that since there are two teachers in the classroom, the material is presented from various angles (i.e. from the book's and the teachers' perspective) and thus the students will</p>	

<p>dra sammen der ifra, så kan han andre læreren komme inn å si ting på sin måte. Og til slutt faller kanskje brikkene på plass. Det tar litt tid...</p>	<p>be able to understand it.</p>	
<p>12. F: Hvis vi tenker litt på eksamen, hvordan kan elevene forberede seg for å få en vellykket eksamen? L: Sånn som jeg mener i hvert fall, sånn som vi gjør det nå, så kjører vi teori og praksis, side om side, og veksler hele tida mellom, tar litt teori nå og litt teori da... Og da vil jo all den teorien være vinklet opp i mot akkurat det område som vi jobber med nå,</p>	<p>12. S explains that there is a constant exchange of theory and practice within the learning procedure, something that contributes to the exam preparation.</p>	<p>12-14 Presenting the conditions for a successful exam, S indicates that what the students learn in theory and its application in practice are closely connected time-wise. S considers this close connection part of the exam preparation.</p>
<p>13. sånn som det har vært før, så har vi kanskje drevet med motor, og et felt innenfor motor tidlig på høsten, mens vedkommende elev ikke har kommet til å få skrudde på motor før lang ut på andre termin, og da blir det likesom et lite sprik i mellom der. Særlig for den som har lite ballast i fra før, og kan veldig lite for ikke å si noe om bil fra før.</p>	<p>13. S opposes the lessons which are built up in a way that the time distance between theory and practice is so big that the students do not benefit from the instruction.</p>	
<p>14. Og vi mener det i hvert fall da, med sånn vi gjør det nå, at når teori og praksis går hånd i hånd, at de skal de i hvert fall bli fullstendig like forberedt på eksamen som sånn som at det ble gjort på gamle måten.</p>	<p>14. S explains that with theory and practice strongly connected, the students are well prepared for the exams.</p>	
<p>15. For nå kjører vi da et visst antall uker på de forskjellige områder innenfor bilfagene, og så vil det jo selvfølgelig bli en runde med repetisjon før eksamen. Det er jo greit, for -det er klart- sånn som med</p>	<p>15. S states that before the exams, they go back to the various areas they have covered throughout the year.</p>	

<p>den første modellen som vi startet med ved skolestart, det ville jo bli langt tid til eksamen kommer, så vi er nød til å ha repetisjon på vei.</p>		
<p>16. F: Hvis det er noen vanskeligheter, og noen elever kommer og sier 'jeg vet ikke hva jeg må gjøre for å forberede meg', hvordan kan du hjelpe? L: Vi har tid til å gå inn å ta for oss han eleven i, for det vil jo være innenfor et relativt snevert område, det har vi tid til. Og det vil jo hele tida skje litt sånn vekselvirkning mellom de ulike moduler framover om vi er ferdig med "motor" i sånn hermetegn, så vil det ikke samme i motor, blir vi jo aldri ferdig med så lenge vi holder på med bil. Han er jo der og vi kommer jo litt tilbake og snakker om ting.</p>	<p>16. S explains that the teacher provides help at an individual level when problems arise within a specific subject area, under the continuous exchange between theory and practice.</p>	<p>16-17 Discussing her role in assisting the students with the exam preparation, S indicates she repeats and clarifies the areas the individual student faces difficulties with, both in theory and in practice. S adds the students are allowed to make mistakes, and thus learn.</p>
<p>17. F: Så mener du at du forklarer saken litt mer? L: Ja, akkurat, og det bygger på kanskje smått litt mer kjøtt på beina da etterhvert. F: Så det har mer med forklaring å gjøre... L: Ja, klar forklaring, både forklaring og repetisjon av forklaringen, og å få lov til å prøve å feile som sagt.</p>	<p>17. S specifies that her help includes repeating and clarifying the material and in giving space to the students to commit mistakes.</p>	
<p>18. Det virker som det fungerer, men vi har ikke hatt eksamen på det grunnlaget, men som sagt, de tilbakemeldinger vi har fått fra elevene om den her formen å gjøre det på, så er den absolutt ensidig positiv i hvert fall.</p>	<p>18. S says the students have positive reactions to the way the lessons are done.</p>	

TEACHER 3

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Hva er din forståelse av disse 2 formålene i forbindelse med ditt fag? Hva betyr kritisk tenking? L: Det vil si at vi må prøve å få elevene til å vurdere, også på bakgrunn av erfaring, og sammenligne med det de oppfatter og gjøre sånn etterhvert. Det kan være en måte.</p>	<p>1. S says that critical thinking includes evaluating a situation based on one's experience and current understanding in order to act accordingly.</p>	<p>1-2 S indicates that critical thinking includes adapting working methods that contribute to a successful outcome, even when applied at novel situations. S specifies this requires experience and consideration of the extant situational factors.</p>
<p>2. Tenker du spesielt som fag? F: Ja. L: Hvis du gjør en jobb, så gjør du ofte feil, til å begynne med i hvert fall, og da er det selvfølgelig en måte å lære på, at du ikke gjør samme feil siden, og så klarer å vurdere nye måter å jobbe på f.e. bruk annet verktøy, eller bruk riktig verktøy, å gjøre en jobb skikkelig, det vil si å få rutiner sånn at du gjøre det riktig første gangen. Det er viktig. Det er også bare snakk om erfaring og læring.</p>	<p>2. S explains that critical thinking in relation to practical job includes acquiring working patterns that allow you to carry our new assignments in a correct way with the first effort. This is achieved through experience and learning, i.e. after having made mistakes, one is able to evaluate various working alternatives.</p>	
<p>3. F: Hva gjør du som lærer for å anvende dette i din klasse? L: Det vi prøver på, jeg snakker i hvert fall om de praktiske fag, og når vi er på verksted så gjennomgår vi i først la oss si en jobb som skal gjøres teoretisk, peker på ting som er viktig, ting som er veldig viktig, og så måten de gjør ting på. Rekkefølge, og så gjør du det først, så gjør du det, og så gjør du det, og så får dem</p>	<p>3. S says that a job assignment is executed at two levels: a) a theoretical one where emphasis on essential features of the work takes place and b) a practical one where the students try to carry out the assignment on their own under supervision, i.e. the teacher tells them what to do when they face difficulties. Repetition of the work leads to learning.</p>	<p>3 Presenting the application of critical thinking in the class, S indicates that the students attempt to carry out working assignments on their own, by using the theoretical knowledge acquired earlier and the teacher's help. S specifies when the students face difficulties, they are advised how to proceed.</p>

<p>prøve selv, og hvis de står fast, så får de selvfølgelig spørre, og så forklarer du at sånn bør du gjøre, og sånn skal du ikke gjøre. Også får dem gjøre det flere ganger, så lærer de ettervert.</p>		
<p>4. F: Og hvis vi tenker litt på eksamen, hvordan kommer elevene fram til eksamen, fra undervisning til en vellykket eksamen? L: Der har vi en kombinasjon av teori og praktisk arbeid. Så det som skjer i forkant av en eksamen, er det selvfølgelig at vi går gjennom, sammen med elevene f.e. en tidligere oppgave, og så sier vi at det er en del først som går på vurdering. Det vil si at du skal tenke gjennom hvordan vil de gjøre sånn en oppgave. Og så skal du sette ned på papiret, at vel, OK, jeg skal gjøre det og det og det, og så skal de tenke gjennom det. Og så skal de vurdere i tillegg hvilket verktøy de vil bruke, og så gå gjennom den praktiske del. Så har de etterpå en evalueringsdel, som de har svart skriftlig på, at OK, hvordan syns du gjorde selv, hva er det du er svakest i, og hva burde du gjøre annerledes.</p>	<p>4. S explains that exams include both theory and practice. S says that the students prepare for them by studying a previous exam assignment, with a twofold aim: a) to solve it all over again, by identifying the actions followed and the means used and b) to assess themselves by identifying their weak points.</p>	
<p>5. F: Og hvis det er noen elever som forstår ikke hva de må gjøre for å forberede seg til eksamen, hva slags hjelp kan du, som lærer gi? L: Ja, dette er jo egentlig et stort problem for ganske mange, og en del av de elevene vi har visse lærevansker; det kan være</p>	<p>5. S states they face a big problem in helping students because some of them suffer from learning difficulties, others face problems with theory and others with practice.</p>	<p>5-8 Discussing her role in assisting the students with their exam preparation, S states she makes use of her experience; she also acknowledges she faces difficulties, due to: a) the students' individual characteristics, weaknesses and needs; and c) time constraints.</p>

<p>dysleksi, f.e., en del har inkludert det, lærevansker sånn generelt, og det er ikke problem bare med eksamen, det er et problem vi har daglig, fordi at man er ganske svak sånn teoretisk, og enkelte er veldig svake, også rent praktisk for å gjøre en jobb.</p>		
<p>6. Så det er stort sprang mellom elvene egentlig. Også har vi alt for lite tid til å bruke for hver enkelte elev, så de som er svakest, det er de som sier minst, de kommer selvsagt til slutt, og det prøver vi da selvsagt å rette opp, men har vi svake elever og vi bruker for langt tid der, så blir det jo uro i klassen, for de som er flink og aktiv, de vil jo finne på noe annet i mellom tida, ikke sant...så blir det kluss rett og slett. Og ofte litt bråk i timer, hos enkelte lærere blir det bråk. Og det går ut over selvfølgelig undervisningen for samtlige.</p>	<p>6. S explains that there is a big difference between the level of proficiency of the students and that the teachers are limited in their help as: a) they do not have the necessary time to offer help at an individual level and b) concentrating on a few students at a time leads to distractions in the classroom.</p>	
<p>7. F: Men har du noen teknikker kanskje som du viser til elevene for å hjelpe dem? L: Det praktiske først, der prøver vi selvfølgelig med din egen erfaring å så si at sånn gjør du, gjør sånn og sånn, og så ikke begynn med det først, men gjør sånn og sånn, det går jo på ens egen erfaring, rent sånt yrkesmessig,</p>	<p>7. S says that the teachers help the students by guiding them in how to proceed with a practical job, based on the teachers' working experience.</p>	
<p>8. og så etterhvert når du har jobbet som lærer da –jeg tror det er 11 år jeg har jobbet nå– så lærer du selvfølgelig at du kan ikke kjøre likt til samtlige. Noen må ha det inn 2 gang og 3 gang, før de i det</p>	<p>8. After having worked for a long time as a teacher, S has realised that each student has individual needs concerning the amount of repetition s/he needs in order to understand the learning material.</p>	

<p>hele tatt fatter det, og kanskje flere ganger også, det varierer selvfølgelig. Og sammen med teorien, du kan godt stå og snakke til en klasse i en time uten at de har fått seg noen ting.</p>		
<p>9. også er jo det er avhengig av når på dagen det er. De to siste timene på fredag, så er egentlig ingen vits i å ha f.e. mekanikk, fordi de er de i en annen plass, oppe i hodet sitt. Det varierer. Da må du prøve å så være litt sånn kreativ, og gjøre noe som virkelig fenger dem, gruppearbeid f.e. eller løse noen oppgaver, eller hva som helst...for det er ingen som gidder å høre på etter kl. 12 på fredag. Det er bare sånn du erfarer etterhvert, selv om du kanskje blir litt sånn motløs. Det hender selvfølgelig en lærer, det er lærerens hverdag, vet du.</p>	<p>9. S states that the level of understanding the students acquire also depends on the day of the week the lesson takes place, as toward the end of the week there is a lack of concentration. Then the teacher has to use those forms of teaching that capture the students' attention.</p>	
<p>10. Vi har jo også mye artig også. De er 17-18 år så det...det går stort sett bra, men det er bestandig noen som gir opp, slutter kanskje, et par utviser vi selvfølgelig også hvert år, hvor de ikke klarer å tilpasse seg. Der er litt sånn strenge regler du skal følge skole reglementet. Så er det en del som aldri har hatt noe som helst av grensesetting f.e.</p>	<p>10. S presents the various reasons for which a number of students leaves the school each year, i.e. expulsion because of lack of ability to adjust and to restrain oneself, cessation of effort.</p>	
<p>11. Og det sier dem etter hvert her at vi er streng og så liker de det. Det er ålreit egentlig. Selv om det er kanskje vanskelig å følge dem.</p>	<p>11. S states that the students like the fact that the school has strict rules, even though it requires an effort to follow them.</p>	

<p>12. Men vi er jo ikke like vi lærere heller, vet du, så noen lar det skure og noen strengere enn de andre. Også blir det litt sånn ”han er grei –ikke sant, fordi han er snill, sånn og sånn” ...Men det varierer litt igjen. Når har jeg personlig hørt at jeg er veldig streng, så er jeg grei i tillegg. Det er god kritikk av en lærer egentlig.</p>	<p>12. S explains that the teachers vary in the degree of strictness, and thus in how the students evaluate them. S says that the students characterise her as strict but fine.</p>	
---	---	--

STUDENTS

MALE 1

MEANING UNITS	TRANSFORMATION UNITS	
<p>I. F: Så her står det ganske mye om tenkning, og kritisk sans og sånne ting. Hva er kritisk tenkning egentlig? E: Å si sine meninger kanskje om forskjellige ting som du lurer på innen fag eller...du får være med å bestemme for eksempel karakterer selv og liksom gir deg selv kanskje en vurdering på det du har gjort. F: Kan du gi meg kanskje et konkret eksempel i forbindelse med ditt fag? Når det gjelder praksis... E: I teorien da, tenker jeg på...har du en teoretisk prøve så kan du bli med i vurdering av den der... F: Mener du vurdering av det som du har skrevet, eller... E: Ja, det jeg skrev, ja, liksom og det å få være med å vurdere karakteren.</p>	<p>1. S states that critical thinking includes expressing one's opinion on various subject-area issues and evaluating one's own work.</p>	
<p>2. F: Og med hvilke kriterier kan du vurdere? E: For jeg har hørt at det er mange som er, uenige i den karakteren de har fått og kanskje det hjelper om man får bli med å få høre hvilke feil de har, og at de får mer klart for seg, hva slags grunn det er for at han får den karakteren...</p>	<p>2. S explains that participating in evaluation of one's work contributes to the understanding and clarifying of a) the weak points of one's work and b) the evaluation one receives from others.</p>	
<p>3. F: Så du mener at kritisk tenkning går</p>	<p>3. S emphasises that critical thinking is most</p>	<p>3-4 S indicates that the students do not</p>

<p>mest på vurdering? E: Ja.</p>	<p>related to evaluation.</p>	<p>demonstrate critical thinking very often, as they are only encouraged to evaluate their own work in special circumstances.</p>
<p>4. F: Gir læreren din anledning til å uttale kritisk tenkning inne i klasserom? E: Nei, han sier ikke direkte at vi skal gjøre det, men vi får gjøre det hvis vi spør om det, men det er ikke alle som gjør det... F: Kan du gi meg et eksempel kanskje når dette skjer? E: Det har jo ikke skjedd enda men...vi har hatt en prosjekt om sånt før...det holder vel på enda. Det er jo det de prøver, på at elever skal få være med å vurdere sin egne prøver, og sitt arbeid. F: Snakker du om teori nå, eller... E: Ja.</p>	<p>4. S states that the teacher does not encourage the students to evaluate their own work, but that the students have the opportunity to do so within a special school project.</p>	
<p>5. F: Og hvis vi tenker litt på eksamen, hvordan kan du lese på en effektiv måte? E: Vi går gjennom det sakte og leser det flere ganger. F: Har læreren gitt deg noen tips på hvordan å gjøre det? E: Ja det er egentlig det jeg sa nå, at en bør gå gjennom det flere ganger, liksom, og se ordentlig hva det står der.</p>	<p>5. S explains that he handles the learning material by going through it slowly many times and by trying to grasp the meaning of the text.</p>	
<p>6. F: Og hvis du spør læreren om hjelp, hva slags hjelp kan han gi deg? E: Han gir meg ingen svar i hvert fall, men...han kan gi meg hint, et lite hint, kanskje eller...snakke litt rundt spørsmål at, kanskje han spør meg om hva jeg tror det er, og hvis at jeg svarer riktig på det så</p>	<p>6. S explains that when he faces problems in executing his work, the teacher does not give him the answer directly, but helps him understand the situation on his own by posing guiding questions that evoke intellectual examination.</p>	

sier han at det er riktig kan du si...da
forstår jeg det bedre.

F: Så han hjelper deg å forstå bedre? Er
det det du mener?

E: Ja.

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det noe om kritisk sans og skjønn og trening i tenkning...hva er kritisk tenkning? E: Jeg er ikke sikker på...vet ikke... F: Kan du kanskje tenke litt på det i forbindelse med ditt fag kanskje, eller praksis på verksted, teori i klasserom... E: Jeg har ikke hørt det uttrykket før. F: Hva med kritisk skjønn? E: ...nei...</p>	<p>1. S states that he has not heard the term.</p>	<p>1-2 When R tried to get a meaning for the term 'critical thinking', S expressed difficulties in understanding it. When R reformulated the term, S stated it includes examining one's profession choices.</p>
<p>2. F: Hvis jeg sier 'å tenke på en kritisk måte', betyr det noen ting for deg? E: Å tenke litt...bli kritisk til den ting du tenker på. F: Kunne du gi meg et eksempel kanskje? E: Kanskje litt negativt... F: Men når du jobber med bil, for eksempel, hvor er kritisk tenkning? E: Man er kritisk til å begynne med bil for eksempel. F: Kan du forklare det litt mer? Gi meg et eksempel. E: Det blir mye kjedelige jobber...dritt jobben...Det stiller jeg meg kritisk til... F: Hvor kommer kritisk tenkning inne der? E: Nei...det bare kommer...jeg vet ikke...</p>	<p>2. S explains that critical thinking involves an examining attitude to one's profession choices mostly regarding their negative sides.</p>	
<p>3. F: Men hvis vi tenker litt på eksamen og prøver, hvordan kan du forberede seg på en effektiv måte for å ha en vellykket eksamen?</p>	<p>3. S states -while studying- he goes through the textbook and his own notes, with an emphasis on areas he lacks knowledge for.</p>	

<p>E: Du bør lese gjennom boka i faget, gjennomgå ting der som jeg ikke kan se over notater som du har skrevet ned.</p>		
<p>4. F: Har læreren gitt deg noen tips på hvordan å gjøre det? E: Ja. Han kommer med tema og emner. F: Med 'tema' mener du et eksempel av... E: Nei sånn grovt, hva vi skal ha om på prøven.</p>	<p>4. S says the teacher informs the students beforehand on the general theme the exam is going to be about.</p>	
<p>5. Det er veldig stort, det vi snakket om, oppfatter et ganske stort område, så vi har en del å lære på.</p>	<p>5. S comments that the learning area that has to be covered is very large.</p>	<p>5-7 S faces difficulties in tackling the large volume of the learning material, and thus concentrates on the parts the teacher indicates.</p>
<p>6. F: Og hvis du ber læreren om hjelp om hvordan å lese, hva slags hjelp kan han gi? E: Han kan fortelle hva du skal lese på, helst litt mer nøye, kanskje du skal lese det og det kapitlet, det står det så mye forskjellig.</p>	<p>6. S explains that the teacher points out the most essential parts of the textbook one should concentrate on.</p>	
<p>7. Du bør jo egentlig lese alt, for å lære av alt, det er ganske vanskelig.</p>	<p>7. S remarks that for a good learning result, the large volume of the learning material has to be covered, something that he faces difficulties with.</p>	

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det noe om trening i tenkning og kritisk sans og skjønn, hva er kritisk tenkning? Hva betyr det? E: Hva er kritisk tenkning? At...kritisk, den er sånn...arbeid ikke...Prøve å så...finne på løsninger... F: Kunne du gi meg kanskje et eksempel i forbindelse med teorien eller praksis? E: ...for eksempel hvis at du har litt problem å få løs en skrue da, så må man jo tenke på hvordan det skal gå å få løsne den, bruke sånn, nei sånn forlenget på å skrue på...jeg tror...</p>	<p>1. S states that critical thinking involves examining ways to solve problems related to the execution of a specific work task.</p>	
<p>2. F: Gir læreren anledning til å vise kritisk tenkning inne i klasserom? E: de...syns jo at du...de kommer ikke for å hjelpe oss nei, men hvis vi spør om hjelp da så, kommer de bort til oss...nei, du må...bare prøv selv. Kommer ikke å hjelpe oss, man må plages ei god stund før de kommer for å hjelpe oss. F: Så mener du at læreren lar dere selv finne løsningen... E: Ja. F: Så hvordan vet du hvordan å takle problemet? E: Nei, du må prøve og feile, vet du...når du feiler så lærer du noe... F: Mener du at feil er en del av kritisk tenkning? E: Når du feiler, så lærer du av det</p>	<p>2. S explains that the students are mainly left on their own to figure out how to execute various tasks, by making mistakes and thus learning.</p>	

<p>også!... vet ikke hva jeg skal si...</p> <p>3. F: Hvis vi tenker litt på eksamen, eller prøver, hvordan kan du forberede seg effektivt, for å få en vellykket eksamen?</p> <p>E: Det var det da: må sitte seg skikkelig inn i oppgaven først og fremst, og så...hvis det har det noe med bil å gjøre, så hjelper det mye å gå ut i bilen, og se og holde på å mekke rundt...</p>		
<p>4. F: Hvis du tenker litt på teorien, hvordan kan du lese på en effektiv måte?</p> <p>E: For eksempel jeg hadde lese- og skrivevansker jeg, så jeg bruker lyd kassetter, så jeg leser og hører på, det tror jeg at jeg hadde</p> <p>F: Og gir læreren deg noen tips på hvordan å gjøre det?</p> <p>E: Jeg altså tar notater og, mens jeg leser, og sånt, så når jeg skriver, så setter jeg og retter noe..</p>	<p>3. S explains that in order to achieve a good exam result, he first grasps the essence of the assignment, and then tries out in practice what is asked from him to answer in theory.</p> <p>4. S states that he has learning difficulties; he takes notes of the lectures which he corrects with the help of audio tapes used to record the lessons.</p>	
<p>5. F: Og hvis du ber læreren om hjelp, hva slags hjelp kan han tilby?</p> <p>E: Nei, hvis at det er noe spesielt som vi lurert på og sånt, han gir oss råd...</p> <p>F: Råd om hva...</p> <p>E: Hvordan du løser enkelte problemer og det som kan oppstå.</p>	<p>5. S says the teacher gives them information on how to solve various tasks, when asked for help.</p>	

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Har står det noen ting om trening i tenkning og kritisk sans og skjønn...hva er kritisk tenkning? Hva betyr det? E: Kritisk tenkning...det vet jeg faktisk ikke... F: Hvis jeg sier kanskje å tenke på en kritisk måte, kanskje det er enklere å forstå... E: Vet ikke hva jeg skal si der...jeg har faktisk ikke hørt begrepet før...hva du gjør...jeg må lese meg til det, tror jeg, så jeg skjønner hva du mener og sånt... F: Så hvis jeg sier 'å tenke på en kritisk måte', det betyr ingenting til deg? E: Nei.</p>	<p>1. S states he has not heard the term before.</p>	<p>1 When R attempted to get a meaning for the term 'critical thinking', S expressed difficulties in understanding the term and its re-formulations.</p>
<p>2. F: Hvis du tenker litt på eksamen, og teori, hvordan kan du lese på en effektiv måte, hvordan kan du forberede seg? E: Til eksamen? F: Ja. E: Når jeg forbereder meg til eksamen, så sitter jeg med pennen og papir, og så skriver ned det jeg syns er viktig, så leser jeg i bøkene og sånne ting. Jeg føler selv at jeg lærer ganske mye når jeg gjør det der, i stedet for bare sitte og lese, og lese og lese...</p>	<p>2. S explains he keeps notes of the most essential information given in the textbook, something that he finds very beneficial.</p>	<p>2-3 S has not received training into studying techniques during his recent schooling, as the teacher emphasises the working means over the studying ways. S specifies he is helped by keeping notes of the essential parts.</p>
<p>3. F: Har læreren gitt deg noen tips kanskje? E: Vi får jo vite hva vi skal lese på og sånn da...det gjør vi...</p>	<p>3. S states he got training into how to read effectively in his earlier schooling, but not at the present time. S adds that the teacher only gives specific information regarding the subject</p>	

<p>F: Men har han kanskje vist deg hvordan å gjøre det på en effektiv måte? E: Jeg lærte av læreren min på ungdomsskole hvordan jeg skal gjøre det der. F: Men ikke nå? E: Nei. Han bare sier at du må lese det, det er det eneste. F: Så hvis du ber læreren om hjelp, hva slags hjelp kan han tilby? E: Han kan jo fortelle om tema, sånn som lakkering og hva slags lakker og sånt vi har da, kan han gjøre sånn...men sånn som det å lese, da må vi stå for selv da, utenom det vi gjør i timen, det som er obligatorisk.</p>	<p>matter, but not about the studying techniques.</p>	
<p>4. F: Og hvis vi tenker litt om når du jobber med bil, når du har et konkret problem å løse, hvordan vet du hva du må gjøre? E: Nei, det kommer jo helt an på skaden da, hvis det er en bulk da, da må du ta og så må du, det kommer an på åssen om hva...hvordan bulken er, er den sånn at det sprekker gjennom hele lakken og grunningen inn til metallet, så må pusse ned helt, og så må vi legge i sparkel for å få det rett igjen da. Hvis det er en stor bulk så må vi slå den ut. Og så sånn verksted og sånn, så følger det med sånn skjema, og så prisberegning og sånne små ting... F: Så mener du at disse står i boka, eller... E: Det står noe om det i boka, våres bok..</p>	<p>4. S feels the teacher does not work very much, as she only gives help when asked. S explains he mostly works on his own, by following the directions in the book; the areas he usually asks help with (by the teacher) is whether he took the correct action.</p>	

<p>F: Så jobber du selvstendig, eller sammen med læreren?</p> <p>E: Begge deler.</p> <p>F: Så hvis det er noen ting som du ikke kan takle, hva skjer da?</p> <p>E: Jeg bare spør læreren. For eksempel ting vi trenger hjelp til for eksempel jeg er ikke helt sikker på om det er helt rett og sånn, på bulken eller det vi har sparklet, så jeg bare spør ham.</p> <p>F: Gir han anledning til å jobbe deg selv, alene, eller?</p> <p>E: Om han jobber ved siden av oss som vi jobber? Nei, han blir for det meste sittende inni kontoret og sånn da. Og så er han ut med oss når vi spør om hjelp, så hjelper han, han har lite å gjøre...Jeg tror han er, han jobber vel ikke så veldig mye selv, jeg har sett han gjort det en eller to ganger, eller noe sånt, det er ikke så veldig mye mer.</p>		
---	--	--

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Her står det noen ting om trening i tenkning, kritisk sans og skjønn...Hva er kritisk tenkning? Hva er 'å tenke på en kritisk måte'?</p> <p>E: Å tenke kritisk...når ting skjer da... eventuelt...Kanskje det...vet ikke...</p> <p>F: Kanskje hvis du gir et eksempel, blir det lettere å forstå hva du mener...i forbindelse med bil, teori eller praksis.</p> <p>E: Det er vanskelig for meg å svare...</p> <p>F: Kanskje hvis du tenker på når du jobber med bil...finnes det kritisk tenkning der?</p> <p>E: Ja...eventuelt, ting som kan skje, og eventuelt fare med løsemidler sånn som vi har på det verksted her hvor de tenker kritisk til det.</p> <p>F: Du sa 'løsemidler' ...</p> <p>E: Løsemidler, det er det som...</p> <p>F: Jeg mente hvor kommer kritisk tenkning der?</p> <p>E: Det jeg mener er at sånt som kan skje hvis du innånder stoffen,</p>	<p>1. S states that critical thinking is found in considering the consequences of various work-hazard situations that can come up in relation to the use of certain working tools.</p>	<p>1-2 S indicates that critical thinking is involved in the examination of potential work hazardous situations. S specifies it is the teacher who indicates the precautions that need to be taken in relation to these situations.</p>
<p>2. F: Så gir læreren din anledning til å vise kritisk tenkning?</p> <p>E: Jada. At vi bruker verneutstyr og sånn...</p> <p>F: Hva slags anledning gir han? Et eksempel...</p> <p>E: Det er vanskelig... læreren?</p> <p>F: gir anledning til å vise kritisk tenkning.</p> <p>E: Hvordan han viser det?</p>	<p>2. S explains that the teacher points out the precautions the students should take in relation to work-hazards.</p>	

<p>F: Hva gjør han for å gi deg sjanse til å vise kritisk tenkning. E: Hvis han ser oss uten verneutstyr, så kommer han og påpeker at vi skal bruke ting og sånn for å berge helsa vår. F: Så mener du at dere kan velge ting, eller... E: Velge...hvordan vi selv vil det. F: Og det er en del av kritisk tenkning, eller... E: Ja...og så må jeg ville, og så...</p>		
<p>3. F: Hvis vi tenker litt på eksamen, prøver, hvordan kan du lese på en effektiv måte for å ha en vellykket eksamen? E: Nei...altså...det jeg helst vil gjøre selv det er å sitte hjemme på hybelen og holde på i fred og ro uten noen forstyrrelser. F: Og hvordan kan du takle stoffet? E: Jeg har tatt notater og... F: Notater av hva? E: Av det vi har gjennomgått i skoleåret F: Og det hjelper deg, eller? E: Ja, for meg så gjør det det i alle fall.</p>	<p>3. S explains he studies in an free-of-disturbances environment; he keeps notes of the learning material, something which he finds beneficial.</p>	<p>3-4 S has received information on some studying techniques (i.e. quiet studying environment, keeping notes) that he finds helpful, and makes use of. S specifies this information came from his teacher, how also provides additional help with clarifying the learning material.</p>
<p>4. F: Har læreren gitt deg noen tips om hvordan å lese? E: Ja, han har jo...han minner oss på hele tida at vi ikke må, han sier at musikk og sånn forstyrrer oss når vi leser. F: Og hvis du spør han om hjelp, hva slags hjelp kan han gi? E: Han hjelper oss og blar opp de sidene vi har problem med og så påpeker og så forklarer nærmere hva det betyr da. F: Mener du forklaring?</p>	<p>4. S states the teacher emphasises that the studying environment should be without disturbances; she also gives further explanations on the learning material the students face problems with.</p>	

E: Ja, forklaring.			
--------------------	--	--	--

PEDAGOGICAL LEADER

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Først så lurer jeg på hva du gjør for å kvalitetssikre at elevene i videregående skoler er trent i kritisk tenking. S: Ja. Vår oppgave, altså det er den primære oppgave for skolene. Og vår oppgave blir jo på et mer overordnede nivå da.</p> <p>2. Og gjennom den årlige rapporteringen som skolene gjør til oss og gjennom de årlige skolebesøkene som vi gjør for å følge opp den rapporteringen så blir det mer sånn generell oppfølging av at skolene gjør jobben sin, utfører oppdraget sitt.</p>	<p>1. S considers training in critical thinking a school issue that belongs to a level of duties that includes more detailed matters, and thus is the schools' responsibility, not hers.</p> <p>2. S explains her duty involves ensuring that the schools generally function in a proper way. S specifies this is actualised by being in contact with the schools rather infrequently, in the form of both a personal communication and a written school report.</p>	<p>2-3. S clarifies her duties include to control of the general functioning of the school, and advise them to apply the guidelines of the core curriculum, through infrequent contact. Critical thinking is considered a more detailed issue, and thus not belonging to the area of her responsibilities.</p>
<p>3. Slik at vi har ingen konkrete tiltak som går akkurat på dette, vi spør ikke spesielt etter dette, men understreker, altså skolenes plikt å følge opp den generelle læreplanen, generelt. Men dette er ikke et spesielt gjenstand for vår kvalitetssikring, for å si det sånt.</p>	<p>3. S specifies she does not examine in detail specific issues concerning schoolwork – critical thinking included- but rather strongly recommends the schools to apply the guidelines of the core curriculum.</p>	
<p>4. F: Men du nevnte noe om en skolerapport. S: Ja. F: Så hva inkluderer denne årlige rapporten? S: Ja. Der har vi laget en mal, og stilt noen spørsmål, som stort sett er de samme, eller vi forsøker å holde denne malen så konstant som mulig, etter hvert år, da har vi vektlagt en del innholdsmessige nyheter ved reformen. Eller det som er spesielt fokusert og det gjelder slik som differensiering, elevvurdering, skolevurdering,</p>	<p>4. S explains the written report issues intended for the schools to comment on, mainly regard the pupils' activity during the central aspects of the learning procedure and the evaluation methods. S stresses the report issues directly stem from the main guidelines of the Reform 94 and thus remain basically the same each year.</p>	<p>4-6 As the core curriculum includes a vast area of issues, S explains that the written and oral contact she has with the schools addresses only selective issues out of the Reform central guidelines, which mainly concern the students' active participation in the learning procedure.</p>

<p>elevmedvirkning i opplæringen – i planlegging, gjennomføring og evaluering av opplæringen- det er de sentrale tingene som vi gått igjen de siste årene</p>		
<p>5. og det er det vi sitter igjen med nå, under årets skolebesøk som vi er midt oppe i, ellers så blir det for omfattende hvis vi skulle ta alle sider ved den generelle læreplanen. Så akkurat det, å...</p>	<p>5. S states the school report addresses only selective issues included in the core curriculum, as the latter covers a quite large area of educational matters.</p>	
<p>6. F: Så det er ikke inkludert i de sentrale temaene i denne rapporten, eller... S: Når vi besøker skolene så spør vi, eller så går vi spesielt dypt ned i disse temaene som jeg nå nevnte, som skolene allerede har skrevet noe om, eller kanskje de ikke har skrevet noe om det, men skulle ha gjort det.</p>	<p>6. S says she examines in detail the selective issues present in the report, which the schools are obliged to comment on.</p>	
<p>7. Og da går vi i hvert fall inn på det, under skolebesøket, for å være en slags pådriver, sørge for at skolene ikke glemmer det. Og da vil vi enten gi ros da eller vi vil utfordre skolene, hvis vi syns at de ikke har gjort nok på de områdene her.</p>	<p>7. S states her role is to keep the schools aware of the issues present in the report, by assessing the schools' activities either positively or negatively, based on whether they are in accordance with the core curriculum guidelines.</p>	
<p>8. F: Men det går ikke spesielt på... S: Det går ikke spesielt inn på disse temaene som du har trukket fram her, nei det vil ikke det. F: Nei, OK. S: Vi går ut ifra at det er, det er en del av den daglige jobben som skolene...</p>	<p>8. S specifies she does not see the necessity of engaging with the application of critical thinking, as she considers it an issue the schools deal with on an everyday basis.</p>	
<p>9. F: Akkurat. Så på hvilken måte tror du at lærerne kan gi anledning til elevene for å utvikle og trene seg i kritisk tenking? Fra din erfaring...</p>	<p>9. S states that when the schools make use of the learning methods pertaining to the Reform 94, i.e. by engaging the students in an active way, they also train the students in</p>	

<p>S: Ja. Når det gjelder begge de tingene her så tror jeg at hvis lærerne bruker de arbeidsformene som naturlig hører til reformen, altså de elevaktive arbeidsformene, hvor elevene er selv aktiv også i kunnskapsinnhenting så tror jeg at, det er i hvert fall et bidrag til å oppøve kritisk sans. Og resonnement, observasjoner, eksperimenter, altså dette er elevaktiv opplæring. Og det er den helt sentrale pedagogiske fokus i reformen.</p>	<p>critical thinking.</p>	
<p>10. Så jeg tror at det er samspillet vårt, så jeg tror at kanskje indirekte vil vi nok, så tar vi oss av disse temaene som du tar opp her, ved at vi fokuserer på den pedagogiske arbeidsmåten.</p>	<p>10. S states that the learning methods applied at schools is indicative of training into critical thinking.</p>	
<p>11. F: Kunne du kanskje gi meg et litt mer konkret eksempel på hvordan lærerne kunne gjøre dette her i praksis? For å skjønne litt bedre hva du mener. S: Ja, nå er det jo 5 ½ år siden jeg sto i klasserom selv, og jeg glemmer fort for så vidt, men...altså prosjektarbeid, mener jeg er et eksempel på den type elevaktivitet, hvor elevene selv velger tema, får det godkjent, og så står for hele arbeidet, står for å finne ut hvor de skal hente informasjon, innhente den, bearbeide, skal så fremstille dette her, og så å si undervise de andre i dette her, og den prosessen som ligger i et prosjektarbeid, mener jeg må være velegnet for den type, oppøve den type egenskaper.</p>	<p>11. S illustrates that when the students participate in project-work, they are specifically in charge of; finding an appropriate assignment theme, finding and acquiring the necessary information, co-operating with each other and presenting the knowledge acquired to the others.</p>	
<p>12. F: Altså hvor kommer kritisk tenking inn i bildet?</p>	<p>12. S specifies the intellectual elaboration of information includes the evaluation and</p>	

<p>S: I vurdering av kildematerialet, i vurdering av de informasjonen de henter inn, det er der hvor kritisk tenking kommer i bildet, og de skal sammenstille forskjellige informasjon de har hentet fra flere kanter, så vil jeg tro at kritisk sans og kritisk skjønn vil komme inn i bildet.</p>	<p>comparison of the pieces of information available from various sources.</p>	
<p>13. F: Og syns du det er noe forskjell mellom de forskjellige skoleretninger, f.e. hvis vi tar allmennfag på den ene side og så yrkesskolen på den andre. Tror du det er noe forskjell på måten de kunne gjøre dette her, eller...</p> <p>S: Det er kanskje litt vanskelig for meg å si for jeg har aldri jobbet i en yrkesfaglig studieretning, har allmennfaglig bakgrunn. Så akkurat det, når innfallsvinkel er kritisk sans, så er jeg litt usikker på...jeg er usikker på det.</p>	<p>13. S states her personal school experience regards only the theoretically oriented subjects (AA). This does not allow her to make any statements about the other types of training.</p>	
<p>14. F: OK; så prosjektarbeid f.e. er en måte å utvikle kritisk tenking. Så hvordan kan lærerne sikre på at elevene egentlig utvikler kritisk tenking, hvordan kan de sjekke det?</p> <p>S: Ja, det kan de jo sjekke ut ved å legge inn i altså i fremføringen, i presentasjonen av et prosjektarbeid, så kan de jo da bestemme at elevene skal foreta en vurdering av den informasjon de har fått inn, altså av de kildene som de har brukt, og så fremføre det. Det vil jeg tro kan, må være en brukbar måte å sjekke det ut på.</p>	<p>14. S states the students employment of critical thinking is reflected in the presentation of the intellectual evaluation which was carried out on the various information used.</p>	
<p>15. Ellers så er det jo selvfølgelig at læreren er villig til også å følge med gruppene under prosjektarbeidets gang, og være til stede og</p>	<p>15. S adds the close observation of the way the students carry out project-work, attention to the working methods employed and the</p>	

<p>høre hvordan de jobber, hvordan de samtaler da. Så også der vil jeg gå ut fra at det er mulig for læreren å sjekke ut det.</p>	<p>oral discussions carried out, is indicative of critical thinking employment.</p>	
<p>16. F: Så hvis vi konsentrere oss om allmennfag som er ditt område, så er det noen forskjell da mellom f.e. norsk, drama og formgivning fag? S: Norsk er et fag, formgivning fag er en studieretning, drama er også en studieretning... F: Ja, jeg mente norsk, som et eksempel på allmennfag... S: Altså hvis vi holder oss til temaet prosjektarbeid, eller arbeidsmåten prosjektarbeid, så...den er litt problematisk å gjennomføre, fordi jeg har ikke noe erfaring hverken med drama eller med FO. Så, så godt kjennskap til arbeidsmåten har jeg ikke at jeg kan sammenligne et hvilket som helst allmennfag altså...</p>	<p>16. S states her experience addresses the general theoretical (AA) studying direction, and cannot thus provide any information about the other subjects.</p>	
<p>17. F: Jeg mente at...f.e. du sa 'prosjektarbeid', og det kan jeg forestille meg i norsk, f.e. eller samfunnsfag, men hva når det gjelder matematikk? S: Altså jeg kan jo se for meg at dette prosjektarbeid...altså et prosjektarbeid er i alminnelighet eller skal helst være tverrfaglig, slik at i allmenn studieretning så skal det gjerne involvere både, kanskje både norsk, og matematikk, og samfunnsfag, og engelsk, og da splitter vi ikke opp fagene som når du tenker på hva utbyttet er, da ser du på hele den tverrfaglige sammensetningen. Da blir det vel vanskelig</p>	<p>17. S explains the students produce project-work that involves more than one subject-area at a time.</p>	<p>17-18 As they schools are obliged to carry out at least one project-work including more than one subject-area at the time, S presumes this actually concerns the majority of the schools.</p>

<p>å skille fagene, akkurat på det feltet her.</p> <p>18. F: Så det er sånt det skjer på skolene her i området?</p> <p>S: Ja, kravet er jo at alle elevene skal ha gjennomført minst et tverrfaglig prosjektarbeid på hvert årstrinn. Og da er det dette med tverrfaglige prosjekt som er det mest alminnelig, altså mange klasser, mange skoler så gjennomfører man mer enn et prosjektarbeid per år, men jeg har inntrykk av at de fleste prosjektarbeidene er tverrfaglig slik at de i alle fall inkluderer to fag.</p> <p>F: Så er det sånn en regel, eller er det opp til skolen å bestemme...</p> <p>S: Altså det er utover, et tverrfaglig prosjekt er altså reglen. Og det er det minste krav, men utover det så vil det variere og skolene avgjør selv.</p>	<p>18. S specifies the schools are required to carry out at least one project-work that involves more than one subject-area, something which S presumes to apply for the majority of the schools.</p>	
<p>19. F: Og så går det i denne rapporten som du snakket om før?</p> <p>S: Ja, altså rapportering om prosjektarbeid har vi hatt i rapporten, det har vi nå etterhvert utelatt fordi at den har blitt så godt innarbeidet, det var en periode det skulle innarbeides, at vi syns er viktig å spørre etter det. Så nå er ikke det en fast post på malen lenger. Og nå har skolene fått såpass grep for det at vi regner med at det går av seg selv.</p>	<p>19. S explains the school report does not include issues that the schools are assumed to deal with very successfully, as for example project-work.</p>	
<p>20. Det er så mye vi kunne ha spurt om, i en sånn rapport skjønner du. Men da blir det lett svært mange sider, og vi skal sammenstille alle rapportene til en felles rapport som egentlig sendes til politikerne, og da blir det</p>	<p>20. S states that the authorities are informed about the schools' function through an accumulated, final report based on the individual reports the schools fill in. S explains that thus, the issues included in the</p>	<p>20-21 S indicates that external reasons pertaining to the authorities dictate the limitation of the report topics to a selection based on central issues of the core curriculum.</p>

<p>fort nok så tjukt, så vi hadde vært nødt til å konsentrere oss om noen få temaer.</p>	<p>individual reports are only selective, as their number is determined by the goal that the final report be as compact as possible.</p>	
<p>21. F: Altså med hvilke kriterier velger dere disse temaene? S: Ja, da har vi valgt ut de sentrale pedagogiske fokus-områdene innenfor reformen, som jeg sa, nevnte i sted, dette med differensiering, elevvurdering, skolevurdering, og elevmedvirkning. Ja, et par temaer til, men det er disse som er de sentrale.</p>	<p>21. S explains the choice of these selective issues is done based on the issues found at the core of the Reform 94.</p>	
<p>22. Og i vår har vi sagt eller skrevet til skolene før vi dro på skolebesøk at det er disse tingene vi kommer til å spørre om, som vi ønsker å snakke om når vi kommer ut på skolene. Først og fremst de tingene der. F: Altså dette besøket, er det gjennomført en gang i året, eller... S: Ja, en gang i året. Det er om våren.</p>	<p>22. S states the schools are informed beforehand on which issues they will be inspected during the personal contact S has with them.</p>	
<p>23. F: OK. Hvis vi snakker litt om en liten forskjellig ting. En ting er kritisk sans og skjønn; men jeg tror at for å ha en vellykket læring, så må først og fremst elevene vite hvordan å behandle læringsstoffet, altså hvordan å lese på en effektiv måte. Er det noe som dere gjør for å sikre dette her, for å sjekke dette her? S: Altså vi på vårt kontor [...] sjekker ikke systematisk om i hvilken grad skolene gjennomfører innføringen av studieteknikk. Vi bare registrerer at, det er ganske alminnelig, at skolene i løpet av den første</p>	<p>23. S states she receives brief, administrative information on the instruction of studying techniques, which are expected to take place during the first school year during a rather short period.</p>	

<p>skoleuka eller de første skoleukene har korte kurs i innføring i studieteknikk for de nye elevene.</p> <p>F: Snakker du om grunnkurs nå eller VKI?</p> <p>S: Ja snakker egentlig om grunnkurs da, her er snakk om de nye elevene, så det er stort sett på grunnkurs at vi har disse oppstart, oppstartperioden, som kan strekke seg fra en, to dager og til en uke, hvor det er svært alminnelig å legge inn innføring av studieteknikk.</p>	
<p>24. Og det er for så vidt også en del av opplegget i et hefte, som er laget med tanke på å skolere elevene i elevmedvirkning. Så uten at vi, vi har ikke foretatt noe systematisk spørrende om hvem som gjør hva av skolene her, men det er vårt inntrykk at svært mange skoler gjør det, kanskje alle, men altså det siste blir antagelse.</p>	<p>24. S states instruction on studying techniques is part of the students' active participation in their learning. S specifies she does not have solid information from the schools on that matter, as it is assumed that the schools do carry out this instruction, due to administrative reasons.</p>
<p>25. F: Og du sa at det skjer særlig på grunnkurs og ikke på VKI eller senere.</p> <p>S: Ja. Det er korrekt.</p> <p>F: OK. Men hvorfor det?</p> <p>S: Nei, det er vel fordi at man regner med at da legges grunnlaget for arbeids studieteknikk og at de ikke trenger det.</p>	<p>25. S explains studying techniques are only part of the first year school plan, as it is during that year that the basic working methods are learnt; this instruction suffices for the coming years.</p>
<p>26. F: Men er det sånn generelt eller i forbindelse med fag, dette kurs?</p> <p>S: Det er litt, det gjøres forskjellige...</p> <p>F: Så det kan være begge...</p> <p>S: Det kan være begge deler.</p>	<p>26. S states the instruction of studying techniques could be carried out both in a general way and in relation to specific subject areas.</p>
<p>27. Men vi fra vårt kontor foretar oss ikke noe spesielt for at de skal gjøre det, det er bare...det kan altså...</p>	<p>27. S adds that she does not examine the application of this instruction at schools.</p>

<p>28. det kommer, og så nesten som jeg sa så ligger i metodisk veiledning fra nasjonalt nivå. har du hørt om det heftet 'veiviseren'?</p> <p>F: Ja, det har jeg.</p> <p>S: Ja, det ligger inne...</p> <p>F: Ligger det inn der?</p> <p>S: Ja, det ligger der...også et eget opplegg som er laget lokalt av våre elever, i fylkeskommunen, som heter 'produktivt arbeid'.</p>	<p>28. S specifies studying techniques' instruction is included in the guidelines of the core curriculum and in other educational leaflets.</p>	
---	---	--

GUDMUND HERNES

MEANING UNITS	TRANSFORMATION UNITS	
<p>1. F: Det først som jeg lurte på er hva er det som ligger i formuleringen av kritisk sans og skjønn.</p> <p>S: Nei, det som...la meg se hvor dette, hvilken kontekst dette inngår inn...og den inngår da i den delen som går på det skapende menneske, og som du sikkert vet, så skrev jeg jo veldig mye av dette selv, og skrev det mye om. Og da forsøkte jeg å identifisere hva er hovedgenrer i skaping. Og du kan si at den ene er knyttet til altså det som har spilt en stor rolle inn på pedagogisk tenkning, som er 'learning by doing'. Altså at du lærer ved å gjøre det og at du lærer ved å gjøre feil, og når du da gjør feil så oppdager du det, man kan korrigere og dette gir etterhvert stadig bedre uttrykk og former.</p>	<p>1. S indicates that 'critical judgement' should be seen in relation to the process of creating something. This process has three main components: a) training into creating through the practical execution of assignments. In that case, one is inclined to take a wrong action, acknowledge it and thus improve one's performance.</p>	<p>1-3 S indicates 'critical judgement' addresses the process of creating, which has three main components. The first one is learning how to create an object through practical training. This idea is encountered in the political and educational arenas, and stems from human history, where various working methods are inherited by the new generations.</p>
<p>2. Og det er også en sånn tanke som en finner hos flere, en finner hos Marx, man finner det innenfor pedagogisk tenking hvor vekten legges på det å lære, ut fra praktisk virksomhet,</p>	<p>2. S specifies the above line of thinking is encountered in both political and educational spheres, where learning is directly related to practical application.</p>	
<p>3. og det er kanskje også den viktigste av de folkelige tradisjoner, hvis du ser på slike ting som hvordan man lager en slik som en vase sånn som dette [viser til vasen i læreplanen, s. 13]. Så det er noe</p>	<p>3. S specifies that the idea of learning through practical application has a central place in the history of humanity; the various working methods related to everyday activities are inherited by the generations which follow.</p>	

<p>som er utviklet over lang tid og teknikkene på dette er noe som er medført i en tradisjon, og da kan overføres, men som da er knyttet til det praktiske liv. Så det var den ene.</p>		
<p>4. Den andre er motstykket til dette, som er den vitenskapelige tradisjon, som krever spesiell trening som har sine teknikker,</p>	<p>4. S states that the second (b) component of creating is the scientific practice, where one has to learn how to apply specific working methods. S adds this type of learning complements learning in everyday life, (i.e. through practical application).</p>	<p>4-5 The second component is complementary to the first one, and involves learning to apply scientific methods, which can be obtained even by people of a young age. S explains this type of learning involves intellectual elaboration of an article and examination of analogous judgements.</p>
<p>5. men som jeg mener også barn kan lære sine hovedregler, det å gjøre observasjoner, det å stille spørsmål, hvordan kan en observasjon oppfattes og så komme opp med nye forklaringer og så teste dem, så det var den andre.</p>	<p>5. S emphasises that the scientific way of creating consists of: observing an article, setting it under intellectual elaboration, forming a judgement about it, and setting this judgement under mental analysis in order to discover its correctness. S adds this process is accessible even to people of a young age.</p>	
<p>6. Og så er det da den tredje, som er det som er kalt kritisk sans og skjønn, og da måtte jeg, da det ble skrevet, forsøke å gi det et uttrykk, og det betyr, altså det er to ting. For den første må det ha et sett standarder, så da blir det viktig hvordan er det standarder for å bedømme ting. F: Hvem er det som setter disse standardene? S: Ja, for det første hvilke er det de er, hvilke standarder og det er ulike</p>	<p>6. S states that the third (c) component of creating something encompasses critical thinking, which involves: a) the discovery of certain criteria necessary for the evaluation of an object. S specifies that the kind of criteria used may depend on: the nature of the object, the function it serves and aspects of an aesthetical character.</p>	<p>6-9 Discussing 'Critical thinking' -the third component of creating- S indicates it involves three phases: a) identifying the appropriate criteria for the evaluation of an object, depending on the object's central aspects; b) elaborating those criteria in order to discover their origin and purpose, by contrasting their present to their past form and c) learning how to apply those criteria. It is often the case that categories of objects require</p>

<p>standarder for ulike ting, hvis du tar denne vasen her så er det, en standard er hvor mulig er det at den kan romme, har vi et mål på det, hvorfor, avstanden der er en estetisk standard, hvorfor er det vi har gitt den en slik form, hvorfor er det at man har vannkant på begge sider, altså det er sånne ulike kriterier som kan legges til grunn, så det første spørsmålet er da hvilke de er.</p>		<p>use of a standardised evaluation method.</p>
<p>7. Det andre er som du sa hvor er disse standardene kommet fra. Og ofte er de jo utviklet gjennom lang tid. Hvis du tar en slik ting som musikk, så er det slik at selv de mest radikale atonalister legger ikke opp til at man skal spille så veldig mye falsk, men har altså felles for både klassisk musikk og atonal musikk, at man har en skala. Så da blir det viktig for oss å is hvordan, hvor de standardene kommer fra, hvorfor er det de er etablert, gjennom hvilke prosess er de etablert.</p>	<p>7. S states critical thinking involves (b) elaboration of the evaluative criteria, in order to identify their origin, the reason for and the way they were established as a means to assess the object with. S adds that this process includes contrasting the present form of the object with its past one; the aim is to discover which elements remained stable and which evolved.</p>	
<p>8. Og det tredje hovedspørsmålet er da å lære å bruke dem. Og hvis en tar en helt annen sak: Hvis du tar en ting som vinsmaking, så er det ut fra noen, hvordan lærer du å smake vin. Det er ikke igjen noe som man finner på egen hånd, det er en tradisjon. Vi har et helt begrepsfelt på hvordan du karakteriserer vin, det enkleste er jo å si det er ikke sur, og sånn, ikke sant. Men vi er nær ved å si at vi må lære den ved å bruke den. Eller hvis du skal</p>	<p>8. S states critical thinking involves (c) learning how to make use of those evaluating under the assessment of an object. S specifies that in some cases knowledge of a pre-established system of evaluative techniques developed especially for this particular object is also required.</p>	

<p>bedømme et kunstverk. Hva er det som gjør at ulike kunstverk bedømmes sånn som dette her [viser til en plakat på veggen] er ganske frisk.</p>		
<p>9. Så da har altså det spørsmålet hva er, altså, hvilke er standardene, hvor kommer de fra og hvordan å lære å bruke dem.</p>	<p>9. S says that the three components involved in critical thinking are identification of the evaluative criteria for the particular object, discovery of their origin and knowledge of how to make use of them.</p>	
<p>10. F: Så hvor kommer kritisk tenking... S: Den kritiske tenkingen kommer da inn på alle de tre spørsmålene, altså at når du stiller et spørsmål om hvilke er det de er, så når du spør hvorfor er det da ikke andre. Hvilke alternativer kunne det være?</p>	<p>10. S states that critical thinking is present during all those three phases. S clarifies a way to achieve identification of the evaluative criteria is by excluding inappropriate alternatives.</p>	
<p>11. Igjen hvis vi tar en slik ting som utvikling av malerkunsten som et eksempel, hvor man hadde strenge normer om at det skulle være figurativt, og så bryter man med det, og gir det en helt annen form, Picasso som forsøkte å lage tredimensjonale bilder på en todimensjonal plate, ikke med perspektiv og disse tingene som han også behersket, men ved så å si å lage figurene som de samtidig er sett fra to vidt forskjellige kanter.</p>	<p>11. S explains that the development of an object/form of art includes the surmounting of the extant rule framework and the introduction of something totally novel. This can be achieved by combining two working canons that traditionally belong to two different expression styles. S specifies that knowledge of the extant rules is required.</p>	<p>11-13 S specifies that the elaboration of the extant principles, norms and rules, aims at both their comprehension and eventual surmounting. This procedure leads to the creation of a novel framework, either through unique use of the extant canons, or through the introduction of new alternatives.</p>
<p>12. Så det betyr altså at den kritiske sans kommer inn ved at du også lærer deg å stille spørsmål: er dette den eneste standard som kan gjøres gjeldende, eller de eneste? Hvis man skulle etablere andre</p>	<p>12. S states the mental elaboration of the established principles should aim to the introduction of new alternatives.</p>	

<p>hvilke ville det være? Igjen som atonal musikk sammenliknet med klassisk musikk...så det er den ene.</p>		
<p>13. Det andre spørsmål er jo kritisk sans også i forhold til oppfatninger om hvor de kommer fra. Også hvorfor vi lar dem få så sterke innslag i våre liv, jeg tar en slik ting som at...det var lenge en oppfatning at kvinner skulle gå i skjørt. Det var en standard som satt, og den satt lenge og den satt hardt. Men må det være slik?</p>	<p>13. S adds the mental examination of the various norms and rules addresses their purpose and necessity of establishment within the societal sphere.</p>	
<p>14. Og så er det da, det vanskelige spørsmål om da man begynte å bryte ned, å bryte ned disse standardene, hvordan var det det skjedde. Og at vi også stiller de spørsmålene om hva som er og hvordan er de kommet opp, på hvordan det er at de kan endres, jazz i motsetning til, ikke sant, som også er et stilbrudd, de stilbruddene er også da nettopp interessant, det at vi åpner for spørsmål.</p>	<p>14. S acknowledges the fascination and at the same time the difficulty around the identification of the circumstances, the process and the reasons why the established rules and norms were radically changed.</p>	
<p>15. Så det tredje er altså det å bruke disse standardene, der kommer så å si den kritiske sansen om 'skjønner du den'?</p>	<p>15. S states the third component involved in critical thinking is the knowledge of how to make use of the evaluative criteria.</p>	<p>15-16 S illustrates that adequate knowledge of the evaluative criteria pertaining to an object is required in order to assess the object.</p>
<p>16. Altså jeg har vært i Studentersamfundet i dag og hørte en framføring av Vivaldi. Ok. Kan jeg da nok om klassisk musikk til å vite om dette er ordentlig framført? Og det er ikke bare det å spille og slutte på samme tidspunkt, de forskjellige medlemmene i orkesteret.</p>	<p>16. S stresses that the evaluation of an object requires adequate knowledge of the coherent evaluative criteria.</p>	

<p>Men det er også...</p> <p>17. så det er slik at på hvert av disse tre punktene, så kommer spørsmålet om den kritiske sansen.</p> <p>18. F: Ok. Men sånn som jeg oppfatter det, så ser jeg at det er to forestillinger her: på den ene siden så sier vi at elevene må utvikle åpenhet og så gå og finne nye ting, og vurdere nye ting, og så skape nye ting, og samtidig, på den andre siden så sier vi at vi har noen forutbestemt kriterier eller standarder som man må arbeide i forbindelse med.</p> <p>S: Ja.</p> <p>F: Ja syns at disse to ting ikke går sammen. Hva sier du om det?</p> <p>S: Jeg syns at det, det er ikke vanskelig, altså det er sitatet av den siste biten [den andre paragrafen i læreplanen, p. 14]. Altså at opplæring har en rekke tilsynelatende motstridende formål.</p> <p>19. Og hvis jeg skal bruke det bildet, hvis du ser på... jeg har nettopp sett, når vi snakker om Picasso, så har jeg, han har en sånn svær utstilling om tidligere Picassos erotiske bilder i Paris nå. Og samtidig er det en historisk forestilling altså fra det han malte først, han malte jo veldig figurativt så han behersket det til fulle. Det samme gjelder Mattis. Men både Picasso og Mattis bryter med den tradisjonen vi er inne på, men det betyr</p>	<p>17. S states that in all the above three phases, critical sense is present.</p> <p>18. R asks for S's opinion on an apparent contradiction included in S's conception of 'critical thinking', in the sense that the students are required to create novel things at the same time as they use pre-established criteria. S states that the formulation of some training goals in the core curriculum [see 2nd paragraph] might seem contradictory to each other.</p> <p>19. S specifies that in order to introduce new rules, norms and forms, knowledge of the past and extant rules is essential, as well as thorough examination of their origins and the purposes they serve. The introduction of the new rules and norms should be done after extensive mental elaboration, which is also viewed as the expression of an attitude of recognition for the past achievements.</p>	
		<p>18-22 Intrigued by R, S acknowledges that there exists a kind of contradiction in the formulation of 'critical thinking' in the core curriculum -i.e. it includes at the same time creation of novelties and use of established criteria- which nevertheless carries the potential of a positive effect. S indicates that the contradiction is only apparent, as the introduction of a novelty requires adequate knowledge and thorough elaboration of the past and extant conditions concerning the origins and purpose of the object in question.</p>

<p>ikke at de ikke behersker den! Og det er altså slik det skulle være min personlige syn, det er altså en ting hvis du bar diller med deg selv til noe annet, men det jeg syns ligger som en form for kulturelle forpliktelser som inneholder også respekten for fortiden, respekten for det andre har tenkt, åpenheten for det andre har tenkt, da må du både kjenne det og du må arbeide deg inn i det. Og da kan du gjerne ende på med å arbeide deg gjennom det.</p>		
<p>20. Hvis du ser på både Picasso eller Mattis som f. eks. du har på Museum of Modern Art, så har du relieffer av Mattis. Og de første er veldig figurative. Og så skal vi se hvordan han arbeider seg i figur etter figur, bort fra det naturalistiske og over i det du kan kalle det essensielle i hans oppfatning. Når vi ser på noe av det siste han gjorde i livet, så klippet han i papp og limte det. Ok, da er det rene farger og ren form som han bruker. Da hadde jeg sagt han hadde beherskelsen, men han brøt ut fra tradisjonen.</p>	<p>20. S observes that the introduction of new rules, norms and forms occurs over time; production of objects governed by the established rules is followed by the creation of new ones that answer to radically different rules.</p>	
<p>21. Ellers det jeg mener er altså at det er en del, det er en motsetningsfylt, ja, men det er en kreativ motsetning. Så det betyr ikke at det kan, det kan ikke være det ene eller det andre, det må nettopp være begge deler.</p>	<p>21. S acknowledges that there exists a contradiction among the goals of the core curriculum, which though contributes to the creation of a novelty; adequate knowledge of the established rules is necessary in order to introduce something new.</p>	
<p>22. Altså disse spesielle kommuniserende</p>	<p>22. S states that in education, in accordance</p>	

<p>tegn det er liksom, jeg vet ikke om det er det du mener, men i hvert fall syns jeg at vi skal ha den oppfatning at pedagogikk, at menneskeliv er enten en ting eller en annen ting så vil jeg si: det synet deler jeg ikke! Jeg vil tvert imot si at det som er interessant ved både personlig liv og ved filosofi, det er nettopp det, at vi har uforenlige, på et plan, oppfatninger, at vi har paradokser som kan leve side ved side og at det som nettopp gjør det interessant er denne polariteten. Hvis man skulle bruke et fint ord på det, og det ville jeg i og for seg nødvendig bruke, det er altså at dialektikken ligger i dette i hvert fall. At det er dialektikk i den forstand at en spenning kan gi kreative eller overstigende innsikter eller ytelser.</p>	<p>with everyday life, there exist contradictory situations and notions that create a situation of intensity. Nevertheless, this situation is found attractive by S, as it can contribute to new insights.</p>	
<p>23. F: Ja, fordi grunnen til at jeg sa det, det var at ut fra de samtalene jeg hadde med lærere og elever på videregående skoler så hørte jeg igjen og igjen at kritisk sans kommer ut ved at elevene vurderer sitt eget arbeid mot noen standarder som er gitt fra skolen. Det er det som jeg ikke forstår helt... S: Nei, altså igjen for å ta et eksempel. Altså det fag hvor du kan se dette eller tydeligst, det er innenfor musikk opplæring. Fordi der skal vi lære en skala, vi skal lære et bestemt typisk skriftspråk som er altså notasjon, og det har stort sett</p>	<p>23. R tries to get a further explanation of the issue that 'critical thinking' involves use of pre-established criteria. S explains that when learning a form of art (i.e. music), one has to master the established rules regarding its basic components, coding system, execution methods and production of new expressions.</p>	<p>23-27 Explaining the role of established criteria in 'critical thinking', S indicates that being trained into an established system (art) requires solid knowledge of the rules that govern the system's central aspects. This knowledge a) serves as a criterion for evaluation and b) constitutes a base on which one can create novel rules and expression forms.</p>

<p>som hovedregler noen takter, at du har altså en hel takt, og en halv takt, og en fjerdedels takt, osv. og du har normer at man ikke skal spille falskt, du vet hva som er skalaens, skalaen som null punkt, om det skal være en ren strøken A, så har du normer hvordan en komposisjon skal være.</p>		
<p>24. Det har utviklet seg, og jeg må innrømme altså at du har normer ikke bare for hva dette systemet er, men også du har materialisert uttrykk for de instrumentene som gir muligheter. F. eks. du kan ikke skrive en fløyte konsert på samme måte som en fiolin konsert, fordi at du må gi rom for at du skal kunne trekke pusten, ikke sant. Og det betyr altså at...mens fiolin, der kan du bare... Ok. Så normene er andre også for komposisjons teknikker avhengig av instrumentene. Og du har normer for solo opptredener og du har normer for samspill.</p>	<p>24. S adds that the rules governing this form of art also concern the various executive mediums. Each medium has certain individual characteristics that the artistic productions must take under consideration.</p>	
<p>25. Hvis du skal lære musikken, så må du lære dette, og du må lære å kunne bedømme igjen og så din egen prestasjon i forhold til dette normverket og hvordan er det min fiolin- gnikking sammenlignes med Arve Tellefsen. Og så for å se opp en måte hva som er igjen det er at du holder deg opp mot de som er de beste utøverne.</p>	<p>25. S states that when one is trained in a form of art, one should have knowledge of its evaluative criteria which include: a) the extant system of rules and b) the performance of those who are doing distinctively well according to the general acquiescence.</p>	
<p>26. Men igjen er det slik at, det betyr ikke at du da når du behersker den, ikke kan</p>	<p>26. S specifies that the possession of knowledge about the extant norms does not rule out the</p>	

<p>bryte med den tradisjonen, og så er det Arve Tellefsen for å bruke han som et eksempel, har laget noen komposisjoner som er radikale brudd med bare å bruke fiolin som lyd instrument, at han gjør 'tsk, tsk' [produserer noen lyd] mens han spiller.</p>	<p>creation of new, radically different ones.</p>	
<p>27. Da er det sånt som det kritiske er dels det selvkritiske som er altså; er det slik at du behersker det, behersker et fag, men det andre kritiske det er det overskridende. Altså at du ikke kan bryte med det hvis du ikke kjenner det.</p>	<p>27. S states that being critical refers a) to the possession of knowledge on the extant rules governing an article and b) to the creation of new ones.</p>	
<p>28. F: Ok. Jeg skjønner dette her med musikk, f. eks. Hva når det gjelder norsk, samfunnslære? S: Ja, jeg ville si at det er det samme, altså det som jeg ville ha som begrunnelse her det er at, ja, det er slik at barn og ungdom kan tenke noe i ganske radikale tanker om hvordan du kan organisere samfunnsliv og de gjør det. Og det å være ung innebærer også å bryte med det</p>	<p>28. S specifies the creation of radically different rules, norms and forms is attainable within theoretical subjects, where aspects of everyday life are involved. S adds young age is a factor enabling the above creation.</p>	
<p>29. og samtidig jeg ville si at det er ikke alle tanker som tenkes som er nye. Altså du kan si f. eks. 'hvorfor er det vi skal ha en regjering?' som du lærer og må bedømme etter og alt det der. Da er det slik at ja, da er du ikke den første som har stilt dette spørsmålet. Det er en stor tankeretning, med anarkisme som et eksempel innenfor dette, nye varianter av</p>	<p>29. S observes that overcoming of the extant norms leads to the production of radical alternatives, which are not always totally new.</p>	

<p>sånn slags som kaos teori og hva det måtte være. Så det betyr altså at...</p>		
<p>30. også de stridende skoler i ulike tankeretninger er en del av dette kritiske, og må jo si at for å kunne gjøres så bør vi kjenne både variasjons formen, hva begrunnelsene er for de ulike institusjoner. Hvis vi skal ha en diskusjon om 'bør vi fortsette med monarki i Norge?' da kan det være viktig å vite noe om hva har begrunnelsene vært for det systemet, hva har vært begrunnelse for den spesielle varianten vi har i Norge, hvor vi har en konge som har mer å si enn den svenske kongen, eller mindre å si enn den danske kongen i 1860. Så bør vi ha fylke, bør vi ikke ha fylke, bør vi ha representative organer i det hele? Bør vi organisere det i familier isteden for kolonier, slekter, klaner, what ever?</p>	<p>30. S emphasises that in order to produce new ideas and rules, deep knowledge of the extant ones is required, regarding their origin and purposes they serve. A way to examine the above is by comparing the particular situation/object of interest with variations of it.</p>	<p>30-31 S supports that the creation of novel ideas, norms and forms requires a) solid and extensive knowledge of the extant ones, which can be acquired by comparison of the object to its various forms, and b) awareness of the possible alternatives existing.</p>
<p>31. Så for å få kompleksiteten inn i hodet ditt, så må du kjenne at det går an å gjøre det på andre måter.</p>	<p>31. S explains that in order to produce novel elements, one should be aware of the possible alternatives to the extant established situations.</p>	
<p>32. F: Da hva er de evnene som forventes av elevene for å gjøre denne prosessen her? S: Ja, det som er forventet av dem det er at de styrker, nysgjerrigheten deres stimuleres. Og da bør en framstille fakta på en slik måte at de kan identifisere seg med en problemstilling.</p>	<p>32. S states that in order to engage in a procedure of producing novel conceptions, one should have a strong personal interest in the matter in question.</p>	<p>32-35 Discussing the elaboration of issues pertaining to the societal arena, S indicates the students' interest should be stimulated toward that direction. This can be achieved by use of a familiar to the students situation where the influence the surroundings can have on a person is vividly demonstrated. S believes that once the students are</p>

<p>33. Jeg kan gi deg et eksempel. Jeg har noen ganger holdt foredrag for ungdom både om det ene og det andre, og et eksempel som jeg ofte har brukt er om en jente som snakker enda bedre trøndsk enn deg, som heter 'Sunniva Nervik'. Og hun ledet et program i fjernsynet som het 'Pluss' og var sånn flott trønderjenta. Og det var en ting som er forskjellig fra de fleste trønderjenter, for at hun hadde koreanske trekk. Og hun hadde kommet hit da hun var fire år gammel, blitt adoptert, hun ville gjerne da hun ble sånn ca. 20 år, finne tilbake til sin familie i Korea. Og de visste ikke hvem denne familien var, men de hadde gjort et opptakk med det koreanske som hun snakket, for hun var stor nok til å snakke koreanske, da hun kom. Så da klarte de å identifisere hennes koreanske dialekt, og med dette så klart hennes norske stemor å kjenne og finne sin koreanske familie. Så drar hun tilbake og det hun da oppdaget når hun drar dit, det er at hun er ja, har koreanske trekk men er ikke lenger koreansk. Tanten hennes som er der, sier at hun har for kort hår, ikke sant. Maten er veldig forskjellig for det hun er vant til. Poenget er altså at metalæringen i dette,</p>	<p>33. S states one way to intrigue the students' interest in discussions around societal issues, is to illustrate that people carry the potential to form different attitudes and behaviours according to the surroundings and circumstances under which they grow up. These attitudes can refer to societal tacit rules (i.e. hair length) and personal preferences (i.e. food habits).</p>	<p>intrigued, mental elaboration of societal issues will take place, even outside the school frames.</p>
--	---	--

<p>det er altså at i hennes tid, i hennes kropp, kan det leves flere liv, tar du inn den, var du der, så hadde hun blitt som dem, fordi hun dro et annet sted, ble hun en annen person. Slik er det med oss alle sammen. I våres kropper kan det leves mange liv.</p>		
<p>34. Og da kan jeg bruke det konseptet som en sånn inngang til å stille det bredere spørsmålet 'hva er det samfunnet gjør med deg?' og valgene dine. Og så at valgene i Norge er mange flere. De kunne ha valgt å leve koreansk i Norge og folk ville stort sett akseptere det, det hadde vært vanskeligere å leve norsk i Korea, ikke sant. Fordi av rent økonomiske årsaker får hun en utdanning, alt det der som hun hadde. Det er mange måter man kan gjøre det på, jeg illustrerte bare med noen, men det er mange måter å gjøre det på. Det er den pedagogiske utfordring, det er å fange de unge slik at de begynner å gruble på egen hånd. F: Mener du å 'vekke' interessen med andre ord? S: Ja, altså de skal få opp interessen, engasjementet</p>	<p>34. S adds that by examining existing everyday situations, the students can be intrigued to mentally elaborate issues concerning everyday life, i.e. to examine the circumstances they live under, their surroundings.</p>	
<p>35. og så at det ikke er bare noe som skjer i klassen i noen timer, men som de grubler på når de legger seg, eller snakker om når de er på fest, eller spør hverandre om når de er på en sammensatt elevflokk, å si hvordan er det å være innvandrer i Norge.</p>	<p>35. S states the mental elaboration of societal issues should be intriguing at such an extent that it also takes place outside the school frames.</p>	

<p>Hvordan er det å være norsk i Norge? Er det verre?</p> <p>36. F: Ok, så siden du begynte å nevne noen eksempler. Hvis vi snakker litt sånn helt praktisk, hvilke anledninger kan lærerne gi elevene til å utvikle og uttale kritisk sans og skjønn?</p> <p>S: Altså hovedsaken er at det vil være ulike måter i ulike fag. Men hvor det som da skjærer klassefagene er disse tre nivåene som jeg snakket om, hva er standardene, hvorfor er de der, behøver de å være, og det tredje er hvordan er det vi bruker dem.</p>	<p>36. S explains the students can get incentives to apply critical thinking in the classroom by being engaged in the examination of the various evaluative criteria, accommodated to the nature of each subject.</p>	<p>36-39 S indicates the students should be intrigued to elaborate objects and situations by extensively examining the corresponding evaluative criteria. S stresses the teacher should be able to identify and make use of situations and objects that the students are familiar with, and trigger the students' interest by challenging their established features that are usually taken for granted. S clarifies such a procedure can take place in all subjects, accommodated to their particular characteristics.</p>
<p>37. Så hvis vi tar et helt annet innhold, så hvis du tar et verktøy, hvis du tar den plastikk skjeen der borte, så er det flere måter å bedømme den på. Men går vi inn på hvordan man bedømmer verktøy, en skje, det er om: ligger den godt i hånden? Det er et kriterium. Og det er altså noe som vi kan lære, alle har spist med kniv og gaffel hvor det gjør vondt fordi at det er så kantete, det er buttete. En annen det er om, er det slik at det lett bøyes? Du har sikkert spist med en skje som har vært bøyd. Ok. Det er da et annet type kriterium. Og det er da bevisstgjør deg hva er kriteriene for å bedømme et redskap og verktøy. En tredje ting er om det er vakkert utformert. Du kan stille</p>	<p>37. S illustrates that the evaluative criteria for a man-produced tool concern: a) its shape in relation to the feeling created when being held; b) its endurance and c) its aesthetical appearance.</p>	

<p>spørsmålet: 'Kan det være motsetning mellom dem? er det slik at...'</p>		
<p>38. og dette har det vært ulike tankeretninger om, det er noen som sier at det som er veldig funksjonelt, det er det vakre, det funksjonelle er det vakre. Mens andre sier at det er det ornamenterte selv om det er vondt å holde skjeen i hånden. Hvis den ser veldig ornamentert ut, så oppveier det kostnaden ved at den er vanskelig å holde. Eller vanskelig å balansere hvis det er et glass eller hva det måtte være, lett å velte, det er en sånn rekke....og da må du gjøre det så konkret, og du må gjøre dette, kan du stille det spørsmål: Ok, hvor har jeg fått det fra, at dette er noe at vi skal ornamentere det vi omgir oss med, hvorfor er dette skrivebordet her så flatt og firkantet? Hvis jeg ser på gamle skrivebord så er det ornamentert, hvorfor forsvant det? og det er altså å vekke interessen for alle disse hverdagstingene – hvorfor skal disse PC'ene være beige? Hvor kommer det fra? Det er ikke noen teknopolitiske regler om at det skal være beige. Og det er noen som har begynt å bryte uti fra det, med 'Apple' ikke sant? Men det var fanget i den forestillingen. Så bruker jeg disse hverdags eksemplene for å vise at det kan være en måte å vekke interessen.</p>	<p>38. S states the students should be stimulated to mentally examine the various evaluative criteria and their variations, i.e. their origin, the function they serve, the reasons why some of their aspects were preferred over others, the reasons why they were altered. S specifies that in such cases, the teacher should make use of situations the students are familiar with, and point out elements that are taken for granted; the reasons for them being as such will thus be questioned.</p>	
<p>39. Da jeg startet med det beige, så smilte</p>	<p>39. S adds that a competent teacher should be</p>	

<p>du, ikke sant; det er sånn gjenkjenning, og da bør jeg som lærer lære når er det elevene smiler og får gjenkjenning på det jeg bruker som eksempel. Det er sånn når man utviklet dansemusikk. Det er jo slik at der er noen som ser på notene og spiller notene, men hvis du skal lage god dansemusikk så må du ikke se på notene, da må du se på: er det slik at noen danser til den? Ikke sant? Og da er det noe musikk som er slik at de spiller folk ut på gulvet, som det heter på norsk. Kanskje hvis det er noen 'lambada' den er slik: når folk hører den så får du lyst til å bevege deg. Det er veldig vanskelig å danse til, men du får lyst til å bevege deg. Så på samme måte med elevene, hvis det er en god pedagog, ikke sant, hva er det som fanger?</p>	<p>able to identify the issues that the students are familiar with and interested in.</p>	
<p>40. Og det er en variant på den andre læremåten 'learning by doing' for et pedagog. F: Så mener du ved diskusjon, eller... S: Ja, altså hvis du skal bruke dette skje eksempel, så kan du gjøre det på en annen måte, lag en skje. Lag en skje! Altså hvordan den ser da, å skjære ut, å spikke, ikke sant. Alle sammen lager til i morgen en skje. Og skal jeg se hva er grunnen til at de foretrekker den ene framfor den andre. Og hvis du ser på en sånn vanlig skje så kan den lages slik som dette . Men</p>	<p>40. S states another way to stimulate the students' interest toward the mental elaboration of an article, is to actually have the students produce the article. The presentation of the various productions can reveal the criteria used each time.</p>	

<p>du kan også gi den en sving, på ulike visser. Hva er fordel med den, ikke sant. Det er mye rart som du da kan se til for du lærer å...men du kan vekke interessen for dette ved at de gjør det. Så det er ikke nødvendig at du som ser på bildet i en bok og går...enn at du, ja.</p>		
<p>41. F: Men sånn som du sier det så forstår jeg at det ligger litt på læreren sine premisser, og sin evne å... S: Jeg ville si det motsatt. Jeg ville si at det er, altså det du må gjøre er å ta utgangspunkt i elevene, i den forstand at det må være...det som gjør at du kan fange dem.</p>	<p>41. R comments on the significance of the teacher's attitude concerning initiation of the above procedure. S specifies the teacher should take under consideration the students' interests in order to introduce issues that they find attractive.</p>	<p>41-45 Intrigued by R, S underlines the duty of the teacher to find the right balance between the students' interest and what s/he wants to communicate; the students' individual characteristics and the everyday situations should also be taken under consideration.</p>
<p>42. Altså at jeg kan komme inn i et klasserom hvis jeg skal et tale, et eller annet slik, og da vet jeg at det har en sånn liten levetid. Og hvis jeg mister den så har jeg tapt, timen eller tapt flokken. Og da kan jeg ikke gjøre det jeg vil. Jeg må gjøre det som gjør at jeg fanger dem. Og det betyr at da må jeg være sånn lydhør både overfor det som kan fange dem og det som jeg ønsker å formidle.</p>	<p>42. S adds that there are two things the teacher should combine during the given time frames of a lesson; what can stimulate the students' interest and what s/he wants to communicate.</p>	
<p>43. Og da kan du si det er en sånn konflikt da, altså igjen. Altså på den ene side så hvis jeg er som helt lydhør overfor deg, så er ikke sikkert at jeg får lært deg noe av det som jeg ønsker å formidle. Og hvis jeg bare er opptatt av det jeg skal formidle så tror jeg ikke det er nok til at jeg skjønner</p>	<p>43. S specifies the teacher should find the appropriate balance between being aware of the students' interests and the issues he/she wants to convey.</p>	

<p>hva det er som skal til for å smyge det inn. Eller provosere deg slik at du tar standpunkt.</p>		
<p>44. Det er mange måter å gjøre dette på, men det er ikke slik at jeg kommer med mitt og forsøker å levere pakken over og fyller deg opp. Det vi må gjøre er altså å fange deg på dine premisser men slik at jeg da får formidlet det jeg skal det er [...] logiske oppgaven, slik at så du ikke får gjespe men interessen.</p>	<p>44. S emphasises that the way the lesson is carried out involves a two-ways exchange between the teacher and the students regarding the students' interests and the teacher's goal.</p>	
<p>45. Men det kan være ulike ting for ulike elever. Og det vil være ulike ting i ulike situasjoner. Har det vært et mord på skolen, er situasjonen, eller en trafikkulykke da er den situasjonen en helt annen. Men da må du benytte de anledningene også til å ta opp viktige ting hver dag, ikke sant.</p>	<p>45. S adds the teacher should accommodate to and make use of the individual characteristics of the students and the everyday situations arising.</p>	
<p>46. F: Så hvis læreren ikke er villig til å begynne noen sånn prosedyre, så...er elevene helt fortapt, eller? S: Nei, ikke det, at det er jo...elevene er jo samtidig som gode husdyr, ikke sant, det er jo stort sett lagelige og snille og...selv om de tar capsen på snei og alt dette som legge beina på bordet og ikke er sånn som de var i bestemors tid når de satt sånn med vilje og tankene flyr og de kaster kuler på hverandre og... papirkuler på hverandre og var mye rart. Så er de stort sett lagelige og finner seg det meste, ikke sant. Ganske</p>	<p>46. S states that in case the teacher does not make use of a situation the students find interesting, the students will learn something anyway, due to their being quite obedient. This, in spite of their behaviour, which sometimes might make them seem uninterested in school-matters.</p>	<p>46-47 S believes that even if the teachers do not engage in intriguing the students' interest, the students will learn something anyway; they usually are quite obedient and receptive to the teacher's messages, sometimes even to an excessive degree.</p>

<p>overraskende egentlig hva de finner seg i.</p> <p>47. Det burde jeg gjøre noen ganger jeg har forelest selv, da satt jeg i gale tall, ikke sant, da sier jeg en ting og så lager jeg en sånn overhead som viser noe annet. Slik at jeg kan se om det er noen som er mot til å si i mot meg. Det er veldig sjelden de gjør.</p>	<p>47. S explains further the assertion that the students are obedient, as they usually accept what the teachers give them, without being bold enough to contradict them; this even when the reasons for doing so are rather obvious.</p>	
<p>48. F: Så det forventes jo noe av elevene og!</p> <p>S: Ja.</p> <p>F: Ok. Så hvordan kan du være sikker på at de har disse evnene som du forventer av dem? Fordi det er en annen ting som jeg har fått inntrykk ut i fra de samtalene jeg hadde, at det forventes noe av dem, men de er ikke klare til å gjøre det sånt.</p> <p>S: Altså mitt hovedsvar på det, det er at de alle fleste kan veldig mye mer enn det de vet.</p>	<p>48. R tries to get S's comment on the possible distance between the qualifications the students should possess and those that they actually possess. S states the students are often not aware of the knowledge they possess.</p>	<p>48-51 Intrigued by R, S indicates the students are expected to possess knowledge that they already have, but might not be aware of. In order for comprehension of complex issues to take place, the teacher should adapt an instructional method that a) allows the students to use the knowledge they already possess and b) makes the issue under instruction attractive.</p>
<p>49. Jeg skal ta en sånn- du har sikkert sett det siden det er ett klassisk gresk eksempel. Og her har vi en firkant, et kvadrat. Og så vil du lage et kvadrat som er akkurat halvparten i flateinnhold. Hvordan skal du gjøre det. Det er et sånn kranglete matematisk problem. Ok. Du vet svaret. Jeg skal vise deg at du vet svaret. Man deler dette i fire. Her er fire kvadrater. Så deler jeg dette i to, da er den biten lik den biten. Så tar jeg bort den halvparten. Så gjør jeg det samme her, og</p>	<p>49. S supports that seemingly complex issues can be broken down to more accessible and understandable parts that the students possess knowledge about and can deal with. The teacher's role is to make this evident to the students, even to the youngest ones, so that they will use their coherent experience to elaborate analogous issues.</p>	

<p>tar jeg bort den halyparten, ok? Du vet det. Det er bare at jeg viste deg at du visste det. Ok. Mye pedagogikk har dette preget. Du vet det. Det er bare å få inn en oppgave, omtrent som å fremkalle en film, å fremkalle i din egen bevissthet at du vet det jeg har forsøkt å fortelle deg. Og det gjelder også seksåringer og syvåringer -de har massevis av erfaringer og da velger de å hugge tak i disse erfaringene,</p>		
<p>50. hvis vi ser på Pythagoras, beviset på Pythagoras. Det ser vanskeligere ut her enn det er, fordi at du er tvunget til å bruke tegninger. Men det finnes en variant av dette beviset på Nettet, hvor denne trekanten her dreies om det punktet og legger seg over den andre. Og da blir beviset mye lettere å se når du har en annen teknikk. Og da vil det ikke være vanskeligere enn dette.</p>	<p>50. S adds there exist instructional methods that enable the students to comprehend complex issues with ease, with the use of knowledge that they already possess.</p>	
<p>51. Slik at som pedagog og også da målbar opptatt av den forståelsen som er det, og så må du bruke den beste teknikken du kan få til for å forklare, eller det som er også viktig er å vekke nysgjerrigheten.</p>	<p>51. S emphasises the teacher should use the instructional method that stimulates the students' interest and enables them to comprehend various issues.</p>	
<p>52. Jeg skal gi deg et annet eksempel ved det siste -jeg skal gi som hjemmeoppgave. Hvis du drar til Akropolis så -dette her er Akropolis. Slik ser Akropolis ut. Og hvis man går dit så har, er disse fantastiske, disse greske</p>	<p>52. S illustrates that a way to stimulate the students' interest in a theoretical mathematical issue, is to demonstrate its application on an everyday life situation, that the students are familiar with and interested in. S adds the students could be first asked to discover the</p>	<p>52-56 S indicates the presentation of a (mathematical) theoretical conception through practice, i.e. by use of an everyday situation/object the students are familiar with, stimulates the students' interest and enables them to comprehend</p>

<p>bygningene, fordi det de har gjort det er at de fått disse til å stå loddrett. Og de står så godt loddrett at de har stått i et par tusen år, ikke sant. Fantastisk er det, skikkelige bygg. Og da er det spørsmålet: hvordan får man ting til å være loddrett? Hvordan gjør man det? Jo man tar et tau og så tar man et lodd som henger i. Og så sammenligner man med dette loddet som henger, da blir det loddrett. Så det er ikke så vanskelig. Det er vanskelig å få det til slik at det sitter godt. Men det er ikke så vanskelig å vite at noe er loddrett. Ok. Men hvis vi ser på Akropolis så har den også flate gulv, horisontale gulv. Og hvordan finner jeg ut at noe er horisontalt. Hjemmelekse til i morgen. Og etter at jeg ble nysgjerrig på dette, hvordan gjør man det, så oppdaget jeg seks forskjellige løsninger, og grekerne hadde en. Skal vi se den greske, vi skal ikke ta alle. Det enkleste er hvis du er oppe på Akropolis, så kikker du ut mot Pireus, og så ser du om du ser havflaten. Så hvis du hadde lagt gulvet på denne måten, ikke sant, og havflaten i det fjerne er som her, så ser du at det er skjævt. Så det kunne vi gjøre med å sikte mot horisonten. Men grekerne var mye smartere enn det, de laget en A. Som her på den måten. Ok. Og så disse beina var like lange på hver side. Så spørsmålet var da hvordan skal vi bruke den A'n til å</p>	<p>solution of the problem on their own.</p>	<p>various corresponding concepts and discover appropriate solutions. The teacher should take under consideration the abilities and level of knowledge the students possess, and thus present the material in a gradual level of difficulty.</p>
--	--	--

<p>få noe loddrett? Da tok de dette loddet her og så tok de en spikker der oppe. Og så laget de et sånn merke her på midten. Og så lot de loddsnoren henge. Hvis loddsnoren henger og det er på den måten, så henger den ikke på midtmerket. Så hvis du hadde da satte dette på gulvet så kunne du justere gulvet ved hjelp av å bruke det samme instrumentet på en annen måte. Intelligent løsning. Fantastisk løsning. Og romerne kopierte det fra grekerne.</p>		
<p>53. Så den er det slik at da kan du forsøke å vekke interessen ved å også gi disse oppgavene, nå har jeg gitt en løsning, det er fem igjen. Hjemmeleksen til i morgen. Kan du komme med en til?</p>	<p>53. S specifies that the teacher should; first present an application of a concept with the use of a familiar situation, in order to stimulate the students' interest, and then ask from them to discover other possible alternatives.</p>	
<p>54. F: Så du mener at evnene er egentlig der, men det er bare hvordan å få... S: Ja, altså de er det mye men så er det da også at hele tiden så er det slik at du bygger dette ut.</p>	<p>54. S supports the students already possess various abilities that the teacher should promote and develop.</p>	
<p>55. Det som er interessant her det er nå at dette bygger også på et sånn matematisk teorem, ikke sant, om at hvis du har en vinkel som halveres og at du har like bein, så er denne vinkelen -hvis du har en bestemt vinkel og du har like bein, så vil halvparten gå på midten. Halve vinkel går på midten. Og det kan du vise altså da med utgangspunkt i en [...] og alt det der, ikke sant.</p>	<p>55. S illustrates that by using the above practical way of introducing a mathematical problem, the students can learn various fundamental mathematical rules.</p>	
<p>56. Så det gir en annen innsikt der om</p>	<p>56. S adds the students should be presented with</p>	

<p>hvordan du får den, altså dette kan brukes til inngang til matematikk. Og når du har fått den ene innsikten så kan du bygge nye på. Altså da kan du bevege deg herfra og dit [fra 'Akropolis' eksempel til 'Pythagoras' i læreplanen, s. 13]. Dette er mer kompleks, men det er på ingen måte uoverkommelig. Det ser bare verre ut.</p> <p>57. F: Så hvis vi tar dette eksempelet her fra Akropolis... Fordi du sa at en matematiker så kunne vel bruke dette her i klasserommet. Hvor er kritisk tenking da? S: Altså ut fra det ene er at- OK, jeg skal vise deg et eksempel på kritisk tenking i matematikken. Her har du en trekant. [fig. 5]. Og -nå vet jeg ikke hvor mye du husker av den matematikken du lærte i skolen- hvis du har summen av vinklene i en trekant, 180 grader. Den svarer til 180 grader. Kritisk oppgave: kan du lage en trekant med mer enn 180 grader? F: Så kritisk tenking er vel... S: Altså da må du bryte ut av den forestillingen som låser deg inn i dette.</p>	<p>the various issues gradually, according to their perplexity degree.</p>	
<p>58. Skal jeg vise deg hvordan å gjøre det? Skal du se en trekant som er på 270 grader i stede for 180? Tegner altså [...] en ball. Dette er jorden.. Så har du ekvator her. Så tar jeg sånn 90 grader av sted. Og her har man polen her oppe. Og da vil jeg dra en sånn meridian opp hit og en meridian opp hit. Ok, dette er nordpolen her oppe, ikke</p>	<p>57. S supports that critical thinking in mathematics is present when one manages to solve a problem by surmounting the conventional frames and rules learnt.</p>	<p>57-59 Discussing 'critical thinking' in mathematics, S indicates it includes the process of combining one's extant knowledge from various subject areas and thus surmounting the conventional rules, in order to produce a novel solution to a problem. Previous illustration of a similar procedure is required.</p>
	<p>58. S illustrates that in order to overcome such frames, one can make use of one's extant knowledge by integrating aspects from more than one subject-area in an unconventional way. A novel situation is thus created.</p>	

<p>sant. Akkurat her, vil dette være 90 grader. Og her vil det være 90 grader. Så den forstand er det samme- 180. Men her oppe vil det også være 90 grader. Fordi at du nå har en geometri ikke i planet, men i en sfære. OK, det er kritisk tenking. Da du bruker [...]</p>		
<p>59. F: Ok, jo, men hvordan jeg som elev kan komme til dette svaret der? S: Ja, det er ikke vanskelig, altså det enten må det bygge... F: Sier du det? S: Ja. F: Fordi jeg skulle aldri finne det. S: Nei men det er for at du har hatt dårlig matematikk lærer, ikke sant. Fordi at det de da må gjøre er å gi deg eksempler på at du kan bryte</p>	<p>59. S explains that in order for the students to be able to create such novel situations, previous demonstration of similar examples is required.</p>	
<p>60. -jeg skal gi deg et annet, veldig enkelt eksempel. Når du teller, så sier vi for eksempel at $2 + 2$ blir 4. Da bruker du de hele tallene, du bruker fingrene. Så sier jeg at 4 -nå kan jeg ikke bare legge ting sammen, jeg kan trekke dem fra hverandre. Så hvis jeg har altså fire fingre og trekker fra to, så blir det to. Så da har jeg hele tallene som jeg kan leke med på den måten så dette er de naturlige tallene.</p>	<p>60. S states that the presentation of simple mathematical concepts can be made with the use of a simple practical illustration.</p>	<p>60-62 S presents a mathematical concept with the use of a practical illustration, in which the extant knowledge of the students is used to create a novel situation, which even though follows known established rules, surmounts the conventional frames.</p>
<p>61. Så kan jeg stille spørsmålet: jeg kan legge til og trekke fra. Hva hvis jeg har to fingre og trekker fra fire fingre? Der kommer det konvensjonelle svar, at det</p>	<p>61. S suggests that one can explain the mathematical fundamental principles by use of the students' extant knowledge, applied on novel situations. This is achieved by the creation of</p>	

<p>går ikke. Du kan ikke trekke fra noe som ikke er der, så da blir $2 - 4$ blir 0. Det er det konvensjonelle. Men det kritiske vil si ok. Hvis det er situasjonen, da lager vi noen nye tall, vi lager et helt sett nye tall [...] for alle disse tallene her, 2, 4 er alle positive tall. La oss lage noen nye tall. Vi finner på noen nye tall. Hva skal vi kalle dem? Det kan vi vel kalle negative tall, slik at $2 - 4$ er -2. Så her har jeg et tallsystem som er som kuler bortover på den måten hvor det er 0 og 1, 2, 3 og 4, [se fig. 6b] så lager vi noen tall linjer med noen på den andre siden. $-1, -2$. Så da ville det si altså at så stiller vi et krav til disse tallene det er at de ellers, bortsett fra at de er helt nye tall, de var der ikke før vi fant dem på, det er vi som har skapt dem nå i løpet av ett minutt, så vi har skapt like mange nye tall på den andre siden, bak speilet. Og vi stiller bare kravet at de skal oppføre seg på samme måte som de oppfører seg disse andre tallene. Kan vi gjøre noe mer da? Med dette? Hva hvis du tar for eksempel nå 4 delt på 2. Hva er det? Det er 2. Men hvis jeg tar da 2 delt på 4, hva er det for noe ting? Og det er ikke et helt tall, hverken noe positivt eller negativt tall. Så da må vi finne på noe ting, finne på noe da som svarer til dette. Og det er noe vi legger mellom de andre tallene, det er brøker. Og noen brøker</p>	<p>concepts that even though are totally new, are nevertheless governed by the same rules as the ones the students already know.</p>
---	--

<p>sånn som her: 4 delt på 2, er et helt tall. Men noen brøker er ikke hele tall så de ligger et sted i mellom. Da har vi igjen laget masse nye tall her, og det er det som kalles rasjonale, som betyr rasioal for brøk, brøktall.</p>		
<p>62. Plutselig har vi skapt en helt annen ting, ikke sant, for at vi bryter ut av det tanke fengslet som vi er i så lenge vi bare tenker på fingre.</p>	<p>62. S explains this requires overcoming the given frames that common sense sets.</p>	
<p>63. F: Så du sier vel at det kommer an på hvordan læreren presenterer kunnskapen? S: Ja, ja, selvsagt, men det kan lærere lære, ikke sant. Disse tingene som jeg har brukt her dem kan du bruke.</p>	<p>63. S states that carrying out the instruction on the above way depends initially from the teacher, who can be trained into doing so.</p>	<p>63-64 S indicates that the teacher is initially responsible for and can be trained into carrying out the lesson on the above way. Nevertheless, S observes this training does not take place, perhaps due to the teachers' overlooking the main essence of the core curriculum.</p>
<p>64. Men slike ting driver de, etter mitt syn, nesten ikke med på læreskolene. F: Ja, det skulle være mitt neste spørsmål. S: Det gjør ikke det. Og det betyr – det er fordi de ikke har skjønt læreplanen. Og det har de ikke skjønt fordi de ikke har jobbet med den. [...] De har lest noe sånt, ikke sant. Så de vil henge seg i litt opp i sånne overfladiske ting som at det er brukt litt arkaisk språk, man skulle bli sånn høvisk med hverandre og... i stedet for å si 'hva er det egentlig man skal gjøre med et prosjekt, hvordan skal vi gjøre det? Hvordan skal vi gjøre det i klassen?'</p>	<p>64. S states the teachers nowadays do not receive training on how to carry out the lessons on the above way. S supports a reason for this is that they give emphasis on other points of the core curriculum; they overlook the essence – which refers to the way the lesson is carried out – and discuss the technical details of it (i.e. the language used).</p>	
<p>65. Hvis det er sånn som du sier som er</p>	<p>65. S supports that adequate elaboration of the</p>	

<p>sant, at det er en motsetning mellom å lære standarder og å kritisere dem, er den motsetningen en sånn logisk motsetning eller er det noe som tvert imot er en fruktbar spenning noe som vi skal bruke pedagogisk. Verden er sammensatt. Det er ikke... altså hva kommer da av at vi står rett opp og ned her opp i nord, denne veien, og i Kina står de rett opp og ned, men de har ikke hodet ned, ikke sant.</p>	<p>core curriculum should lead to the apprehension that the seeming contradiction between possessing knowledge on the evaluative criteria and overcoming them, carries the potential of contributing to the understanding of everyday phenomena.</p>	
<p>66. F: Så det er ikke noen måte å sikre på at lærerne virkelig- S: Ja, altså det som det jeg krever det er jo da at, så vi kan si det på en annen måten også at hvis læreskolene ikke har skjønt det og lærerne ikke har skjønt det nok, og lærerne ikke kan det nok, så er det fordi jeg har sviktet som minister da! Som ikke klarte å kommunisere nok med hva det var jeg egentlig var ute etter.</p>	<p>66. S observes that in order for the educational staff to perceive the content of the core curriculum as intended by S, a successful and adequate presentation by the latter is required.</p>	
<p>67. Og dette var jeg ute etter. De er veldig spennende læremodeller, de er veldig, folk har tenkt mange rare ting, og det som gjør det morsomt å lære ting, og, er akkurat at folk gjør så mange ting og har funnet på så mange ting og laget så mange ting, uansett...beige bokser for eksempel, veldig rart at de valgt at det skulle være sånn beige...hvorfor det, hvorfor ikke hvit ikke sant, akkurat [...]hva er det,</p>	<p>67. S states his goal was to demonstrate that the element that makes learning interesting is the examination of the various articles used in everyday life regarding their established form and the purpose it serves.</p>	
<p>68. F: Siste spørsmål: så er det noen måte at regjeringen eller</p>	<p>68. S states the ones responsible to control the application of the core curriculum at schools are</p>	<p>68-69 S indicates the educational directors are responsible of controlling</p>

<p>utdanningsdepartementet sjekker dette her på? Om dette er anvendt på skolene? S: Nei, jeg syns at absolutt burde det være en oppgave for utdanningsdirektørene og de som arbeider der å si i hvilken grad blir læreplanen virkeliggjort gjennom den faktiske undervisningen som skjer,</p>	<p>the educational directors.</p>	<p>the application of the core curriculum at schools, by conducting analogous discussions with the teachers.</p>
<p>69. og da vil de også vite hva en er ute etter, og det går inn nettopp på den type diskusjoner som vi har nå F: Med læreren... S: Med lærere, ja. For å diskutere alle disse tingene, hvordan er det vi kan gjøre det</p>	<p>69. S explains the educational directors should be in contact with the teachers about how to apply the core curriculum.</p>	
<p>70. og jeg har tatt litt sånn spredte eksempler, men hvis jeg for eksempel skal gjøre det systematisk i et fag, da krever det mye mer gjennomtenking enn disse improvisasjonene som jeg nå gjør, og det krever at jeg tenker ikke bare på faget, men på hvilket trinn det er, hva elevene kan på forhånd og hva er det de kan som de ikke vet at de kan.</p>	<p>70. S stresses that in order to carry out the instruction in the way presented above, one should take under consideration; the pupils' abilities, (both the ones they are aware of and the ones they are not) knowledge, and the subject's nature.</p>	
<p>71. Også det er jo ufattelig mye unge kan, ikke sant, dette med å gå, for eksempel, å gå er veldig vanskelig. Også å forsøke å lære voksne som er utsatt for trafikkulykker å gå, er forferdelig vanskelig. Så det er masse du kan og da er det å bruke dem, men med hvilken rekkefølge skal de gjøres. Må du lære hele fag, for du lærer bolker av .</p>	<p>71. S supports the quite complex acts people of a young age are capable of performing, are usually taken for granted. This realisation comes when one is deprived of the means required to execute such acts. S adds the students' extant knowledge should be used in a certain manner, depending on the demands of the situation.</p>	

<p>72. Og der er det mye lærere kan som de ikke vet at de kan. For de har prøvd seg mange ganger og de vet når de kommer for sent, i elevenes utvikling slik at de syns det er veldig kjedelig for de har hørt det før, eller de kommer for tidlig så de ikke mestrer det de får.</p>	<p>72. S states the teachers also possess knowledge stemming from experience that enables them to identify when learning is successful or not. A factor taken under consideration is the time teaching takes place in relation to the students' level of development.</p>	
<p>73. At det blir for vanskelig å begynne med geometri med beviset på Pythagoras, det er for vanskelig, må begynne et annet sted. For eksempel med trekanter. Og samtidig, du kan -så fort de har lært en trekant, det at summen er 180- så kan du si at 'OK, gjør noe lekser: lag en trekant som er mer enn 180'.</p>	<p>73. S adds that the teacher should be able to identify the fundamental concepts complex knowledge builds on, and use them as a basis for the presentation of more advanced issues.</p>	
<p>74. Og kanskje noen kan komme opp med at det gjelder bare å bryte ut av at geometri bare er noe som skjer i et plan, du kan ha plangeometri på en sfære, og ikke bare på en sfære, du kan lære det på andre ting, du kan lære det på noe som ser ut sånt, som et tårn [se fig. 8] i stedet for en kule, ikke sant. Så vi kan lage veldig mange forskjellige geometrier, alt etter hva vi lager dem på.</p>	<p>74. S explains the pieces of knowledge presented in a conventional way can be approached in a novel way, out of the frames given.</p>	
<p>75. F: Ja, det blir -sånn som jeg forstå det- opp til hver enkel lærer, til rektoren av hver skole, hvis han er villig til å sjekke dette her... S: Det er dårlig, etter min oppfatning, å gjøre har de også en sånn plikt på vist de er skoleledere. Fordi da skal de faktisk</p>	<p>75. S explains the school-leaders are responsible for controlling the way learning is carried out at schools, by motivating the teachers to exchange ideas and experiences on various instruction methods.</p>	

<p>lede. Det er sånn pedagogiske, men ikke i den forstand at en lærer påtvinger andre sin bestemte oppfatning, men i hvert fall engasjerer også lærerne i en ordentlig debatt. Hvordan er det de skal gjøre det?</p>		
<p>76. Fordi at pedagogikk ikke er en sånn stillestående lære, det er noen som hele tiden er under utvikling, og må være under utvikling, fordi elever forandrer seg. Hvis du tar de popsangene som rapperne har, så er det andre tekster enn Melina Merkouri [gresk skuespillerinne og sangerinne], ikke sant. Det er en annen verden, du må forholde deg til den verden som er, men ikke det som er din verden.</p>	<p>76. S emphasises that the pedagogical principles must be adjusted and altered continuously, according to the characteristics of the students and the surrounding circumstances.</p>	

STUDENT OMBUDSMAN

R1: researcher

R2: Erasmus student (from Spain)

R1: Just for an introduction, why don't you tell us a little bit about your role, and what exactly your job is?

E: I'm in Nordland fylket and students' ombudsman in upper secondary schools and for vocational training. And I report to the county governments who have hired me.

R1: What is this in Norwegian?

E: The 'fylketstinget'. And my job is to help students and to get them more interested over their own training and schools and to report back to the politicians and their governments, what they should do to better help the students to participate in their own learning and training.

R1: So how many schools are we talking about in this fylke?

E: In Nordland it is 39 schools, it is about 8,500 thousand students or pupils, and about 1,500 thousand lærlinger [i.e. vocational trainees].

R1: So you are one person in charge of all these people, I mean the one they can refer to.

E: Yes.

R1: And how does it work; can each pupil call you directly, or do they have to go through an organisation?

E: They can call me directly, but in fact I keep a low profile against the single students, but through the organisation the students council in each school they can contact the ombudsman to get help with the cases where they are banging their head against the wall or need some advice how to get it further, or to report cases which should be taken up on a higher level. So mostly it's the student's councils that they come.

R1: So when somebody comes to you and has a problem, you don't give advice or help directly, you have to go first to the fylkesadministrasjon and then back, or...

E: No, if a student council comes to me, I help them out and if they have tried the right day on their school, it's OK, and it's a principle [...] I'll take it further. But if they haven't tried themselves to solve the case, I'll tell them how to do that and go back on their own school and try it. And most of the times that will work out.

R2: And how often [...] With all the people, with working [...]

E: Each autumn, when the school starts, September, October, November, I visit all schools and all the student councils for one day and Nordland it's a big county, it takes time to travel, but that's a priority, to visit all the students' councils and give a days' course, on how to work with their problems with cases they are concerned about and also after the autumn we have one gathering for the leader and the co-leader of the city councils in Bodø, for three or four days, with further training and information on how [...] in these cases. And also during the spring, I try to visit the regions -the county has eight regions- and meet representatives from the students' councils. There students are free to discuss cases and problems which are on the agenda at that time.

R1: And meanwhile if something else comes up, they can always contact you.

E: Yes. And we often use a website to communicate.

R1: Something a little bit more personal maybe. How come, what were the qualifications they were looking in you when they chose you for this position? What's your training I mean?

E: Yes, this is an utviklingsprosjekt [i.e. development project] and in the beginning we were not sure what this was gonna be. And my background to get the job qualified, I have been a student representative on class, school, county and at a national level, and for three years I've worked in the government administration for education in Sør-Trøndelag in a project.

R1: Because you said that you give advice to the students on how to work out problems out themselves. So, what is your training on that?

E: Self-experience, and I've been sitting on the other side of the table, in the government administration and I know how the thinking is there, and you know the system, and you know which buttons to push to solve the problem.

R1: The reason I'm asking is that we are very interested in seeing -if we talk a little bit about this 'responsibility for your own learning'; in theory is sounds very good, but what is happening in practice actually? Because 'responsibility' covers a very big area theoretically, but in practice, what are the students responsible for actually?

E: Saying it in a popular way, the students are responsible to do what the teachers tell them to do, when they tell them to do it, and in the way the teachers tell them to do it. That's the responsibility the students in the secondary school have.

R1: So you mean responsibility to carry out the teachers' directions in a way?

E: Yes. But in Norwegian I would call it 'spissformulering', you have variations. Some schools and some teachers have done this for several years and have much experience and are working very well with students, it's a problem that teachers have problems with giving up the control. They have this need to control students, to know that the students are working well and assure that the best students can pass the exams which is coming in May, that's a problem. But, for me, it's meaningless to talk about responsibility if you don't talk about control, or power. You can't have responsibility if you don't have power or control to make choices which will affect the result. That will be meaningless and that's the problem.

R1: So you mean the way the system works now, the schools are now, they don't give this freedom to the pupils to apply this responsibility to be responsible? Have control over their own learning?

E: Yes, that's the main problem the way I see it. But it's also a problem that the students who come to upper secondary schools –which is my responsibility- have got no training in taking responsibility. We have a system which cares for students in schools, but also outside the schools, it's not allowed to do a mistake and learn by the consequences of it. Because we have a system which cares how much, that's the problem.

R2: But how is it working in the school with more experience, with more years?

E: I see it like, the relations between the teachers and the students are more equal, they have left their traditional roles and are looking upon each other as more equal, which is working against the same goal. The goal is as much learning and the best learning for the individual student, and that's their common goal. And that's what lies in the bottom. And here the teachers have given the control away, the power to decide what to do, the way to do it, how to do it. Not in the way that they say "OK, you are a student, do as you wish" it's in communication or something...

R2: You choose the topic and the text [...] about some text, [...]

E: Yes, might discuss...

R2: [...]semester and you choose really the topics, not the topics maybe, but how, when...

E: Also the topics. How to work with them, should we be reading the text, should we write a report, should we form a drama, and so on. But teachers participate as advisors, all the time. They care of course for the students, we are not talking about stepping back...

R1: So you would say that the guidelines that the are in the core curriculum –læreplanen- in most cases are not applied at all? Because they are saying there, responsibility for organising your learning, choosing the sources, the material you want, how to present it, and evaluate it.

E: That's real [i.e. true]. They are not in practice.

R1: They are not in practice...

E: No.

R1: And you said that one of the main reasons is because teachers have not learnt how to give up control, or co-operate, or...

E: Yes, that's one, and students haven't learnt how to apply this control.

R2: What do the teachers think about this?

E: It varies. Many teachers think this is a good idea, and that we should try to get it work, because some systems are, they see some students that are not mature enough to take this responsibility, they say, and I do not agree. But you also have quite a lot of the teachers, especially in the academic tradition, which think this is my work as a teacher, thus is my area, and I won't let the students into that, because I don't think they can do better than me, and then we have a problem, because then you have to ask the question "What is, how do you look at humans, do you look at your students as humans?" I think sometimes it's the time to ask that question.

R2: There is some project to train the teachers, or the students in order to understand ..

R1: What can be done with the situation? Is that what you are asking?

R2: Yes.

E: After Reform 94 it's been many-many courses for teachers in how to do the teaching, in how the students take responsibility. But teachers won't participate. The teachers who have need to participate in these courses, they won't. It's the teachers who have the right thinking about learning who participate, because they see the need.

R2: Is it voluntary?

E: Yes. The teachers, many teachers want not this kind of courses, but courses which take up the subjects they are teaching in. In Norwegian, "faglig område" [subject area].

R1: But since there are these guidelines from the government or the department, isn't there any control, like some feedback, because if the guidelines say that this should be done at schools, and the teacher resists, who is in charge of checking the situation?

E: According to the law, that's the headmaster of the school, and the utdanningsjef –the leader of the education administration- is responsible to check on the headmaster, and we have statensutdanningskontor, which is the government's or the national government's regional offices, have the responsibility to check on them. But we have a problem in the educational sector, because we have a...report to the county, of the government, how do you call it....we have a 'styringsproblem' [control, governing problem] it concerns this control function, which is not taken care of. A teacher can go into his/her classroom and do a course as s/he likes and it's nobody who asks a question. If you don't sexually abuse the students or are drunk, you can do all as you wish. In the same way, a school does almost as they wish, choose to overlook the...oppfordra, the orders from the level above and it has no consequences. Statensutdanningskontor [State Educational Office], which by the law has this obligation to control the county government, don't do this, they say "it's too bad, you have not done this, and you have to get better, and how can we help you", instead of saying "this is not acceptable, you are breaking the law, you have to do something with this now! This is the student's right, do it now!" They don't do that. They have to have [...] to talk with each other, have good relations, I think they are misunderstanding what a good relation is when they are, the focus is wrong. So we have an obvious problem. Not always is taken care of.

R2: So the inspector doesn't have maybe this knowledge, or...

R1: Yes, why is this happening, I mean starting with the headmaster –let's take it step by step- why don't they want to control, they don't care or they don't think it's necessary?

E: I think it's the tradition in schools; it's the Christian old schools in Norway. In the old days, there was the priest and the resources man – landsman- and the teacher that was the upper class in Norway in small places. And they would control what the teacher did them. And this is still living inside the education sector. We are thinking still the same way. The teacher knows best. And the students have little or no insight in which

rights they actually have. They don't know that they should participate in planning how to do the learning, to do the learning and to evaluate it, as we said earlier. They don't know. And the schools don't tell them.

R1: So you mean the information from this læreplanen is not given out to the pupils so much, or it is not given so much attention to it?

E: It's given out. In Nordland it's given out. But how do you present this? If you ask the teacher to say "OK, this is the curriculum, for this subject, read it. It's not important, really, but you have to read it, OK?" Of course the students will not read it. Why should they? It's not important. Instead of the teachers are working with the students to understand what the curriculum is and how to use it as a tool to give a more effective learning, as it should be. And this is again a problem we had with the Reform 94, which the minister in a hurry made this reform as a [...] to the schools. And that was a major collision with the traditions and the culture in the education sector. I think it was the right thing to do then, and to challenge the sector in that way, but it is still showing that many teachers and many people in the sector have problems with the reform, what they should do, how they should do it.

R1: And you said before that it depends very much on the tradition of the schools. Do you see any difference between the vocational training schools –since you are in charge of both- and the rest of the schools?

E: Yes, I see, it's a difference in culture, the culture is very different from school to school, also between vocational schools and between academic schools. Partly it is of course because the vocational schools have teachers with other background than only academic training. They have been working as many different professions, and are taking the culture from these professions into the schools, and that will affect the school culture. But I also see, and I see that as a problem in Nordland, with growing differences between the schools. Because I think you can change a culture with a systematic work, you can change the culture in the direction you want. It takes time, but if the leaders of the schools have a goal, and systematically work against that goal, it will bring changes in the culture. And that's a problem if we have big differences between the schools, and how they involve the students in their learning, we no longer have an equal right to an equal education as it is a basic principle in Norwegian schools.

R1: How do you mean that?

E: Yes, because I think, [...] for the law thinks that a good learning depends on that the students participate on their own. And if you have some persons that in a large degree involve the students, and some schools in a very little degree involve the students, we have a quality difference in what kind of education they have. Because I think the students that in a great degree have participated, are better suited to meet the life after upper secondary school than the rest. And that's a problem. And that's also a political problem, because the basic principle about equal right to an equal education is very important in Norway.

R1: But how do you think it can be so that the students can take the power to be responsible, practically speaking?

E: I think we have to have more control, to have more steering of the educational system. I don't want a dictatorship, no, I don't want that, but the teachers and the schools are there because of the students, it's not the other way around, the students are in schools because of the jobs for the teachers. And they have to take that into their practice in their daily life. As somebody has a [...] it is my job, I do it often, that you ask for this, also in public, that you challenge them in their thinking about learning. "Why shouldn't the students participate? Don't you believe in your own students? Don't you believe they are in school because they want to learn? And if they are in school because of other reasons, because they don't have anything else to do, can you make them learn? With force? Is that possible? I don't think so. But do you think that, as a teacher? And what good is that?". So you have to work as I said earlier, systematic work against a clearly defined goal. And somehow to communicate the goals to the people who are responsible. And I also believe in educating the student councils and the students who are elected in there about their rights, in that way they can themselves ask for a change. That, "teacher in this law it stands so and so and so; why aren't you doing that?". But this makes conflicts, much conflict. But I don't think we get some development in a total harmony. We have to have conflicts to get change.

R1: But this part concerns the teachers, mostly, as I understand it.

E: Yes.

R1: But you said in the beginning that one other problem is that the students do not qualify, they are not trained for that. What can we do about that? Because it's one thing changing the teachers' attitude. But then what happens with the students?

E: They have to get the opportunity to train this. You can't only read about it. If you choose to learn to play the piano, it isn't any good that you have the book about playing the piano, you have to try it, you have to get the possibility to try and to be able to do these things, to do errors and learn from them. And this takes time. And this time we have to give them. And if after they have finished the primary school, or the primary education, if they haven't learnt it then, we have to start in upper secondary school, we need to spend time in this. And here we have the teachers I have talked with, who have tried this, say that yes, we used a lot of time in trying and trying and trying. It takes a long time, but about Easter, we catch up with the rest and we are passing them in progression in the subjects. But we have to invest that time and give the pupils the opportunity to train; only in that way will they be good to this.

R2: How do the students accept the mistakes, how do the teachers value the work of their students in general?

E: I think that most of the students have a wish about learning as much as possible when they are in schools. They come to schools for different reasons but it's a problem with the whole system and all the grown-ups. I often say when I ask pupils that; [...] are you? A child or a youth? Have

you asked about what you are gonna be when you are young? Have you ever asked that? But have you ever asked are you a child or adult? Who are you? What can you? What can you show us, what can you learn us? So it's the way to look at the students. They are coming to us and we can fill them up with knowledge, or we can train them, the starting point is that you can't anything. But that's not true! Everyone has different experiences and they are experts in...computers -computer science is always a cliché- it could be in soccer, and so on. But why don't we bring this knowledge and this experience into use in the learning society, which a class is? Why? And who should do that? That's the teachers' responsibility. Because this is not only about subject knowledge, it's about growing as a human being. And the schools' role in the Norwegian society as a cultural institution –everyday, almost a quarter of the Norwegian population is directly involved in the school. Then I haven't counted the parents, only the students and it's a very important cultural institution. And we can't only have focus on the subjects. It's about giving the values, about raising the children and the youth to become responsible citizens for the society in the future. But I don't know if I answered your question...

R2: I don't know if it works, that the teacher listens to the students and value the skills of the students. Because I think it's maybe the beginning of that they take responsibility.

R1: Are you talking about those who accept and try to do that or the ones that are totally rejecting it? Because it's different I think...

R2: Yes, I don't know...

E: In the law, if I take one part, it says that every student twice a year should have a conversation, a meeting with their teacher, and that's a success, this is working. And nearly everyone I'm talking with, both teachers and students think that this is good. And in sometime I think that it will...

R2: That is not in the lesson, it's outside...

E: Yes, this is outside, because you know in the lessons you don't have time, because you have to do that...then we are back again, how do you look at learning? What is learning? And if the lesson is organised in a way that the teacher stands and talks in 40 or 45 minutes, who is active then? Who is the learner? And that understanding the teachers must have. If they don't, we won't get any change. And they have to get, feel safe about trying, that's a problem. Many teachers are, they don't trust themselves or the students, or the system to try new things because it could be a fiasco. And that's a problem. And that is the leaders' responsibility to give every teacher safety, a safety net, security to try new things a maybe to do a mistake.

R1: Let me ask something else. In the cases where the teachers and the students are trying, what are the usual problems they face?

E: Generally speaking, is that the things don't go after the plan.

R1: You mean time-like?

E: Yes, both time-like and the results are not as good as the wished.

R1: The results you mean the marks, or...?

E: Yes, that too and the products they produce aren't as great because they have never done this before. It's the first time. But then many teachers say "OK, we tried it, it didn't work. Let's go back to the old things."

R1: So you mean that they evaluate if it works or not depending on the results only or mostly?

E: Yes, mostly. That's the problem.

R1: But is there any difference in the way teachers and pupils react to that? because you said they say "let's go back" ...

E: It's always dangerous to speak general, but let's try. The students often are more concerned about process than results. They experience variations in the lessons and the way their learning is organized as a good thing in itself; variation is good for the learning and motivation. The teachers are in most cases focused on the results and the time they use in this, on the exam, which is coming in May, on the curriculum, which has all this goals and we don't have time because we have to go through the book, and so on. It's all these problems, instead of being focused on the learning process and the individual student. I think we should and in Nordland we had it done some weeks; in Nordland they say that every student can him/herself choose which book they want to use in their own learning. And we have an example of mathematics, with five different books on the same time in the class, and that must have some consequences, how you organise the lesson. You can no longer have as a goal to get through a book during a year. You have to use the curriculum active, all the time. I also think we should stop giving homework in Norwegian schools. The minister recently said that we should have a little longer school days, adapt the Swedish model, with all [...] during the day, but we don't have homework, because here again you have to reflect upon how do you use the time you have and what do we use it in. who is learning, who is the active participant in this we are doing now and further we could maybe at a greater degree give the student, not as in the university, with completely freedom, with the degree with the students' freedom to choose when they participate in a lecture or if they want to do something else. And in that way we change the power control. Less to the teachers who today have all the power and more power over to the students. But personally, I won't change the schools into this economic thinking with a customer and an attributer of services; I think the schools are more important than that, I think –as I said earlier- [...] cultural institution in the society. So it's somebody we have to respect, but we could in bigger

degree than today shift the power to the students. Students who by law are old enough to become parents, but they are not old enough to decide if they should go to school or if they should stay home.

R2: How long to you think this takes...

E: I don't understand why this should take so long time. It's 7 years since we had the reform, in upper secondary schools, it's 12 years, 13 years since the first green paper to the parliament, [...] it's nothing new! We have one teacher and preacher, [...] 150 years ago, who wrote said what Reform 94 was. He described it. As learning. Plato had the same view on learning as we have in the reform. It's not new.

R2: If we imagine about the school in all the societies, in general, it's to change the image about what is school...

E: And if I ask a student today, or a grown-up, or a teacher, "what is school?" they'll say, what pops into your head is classroom, it's tables for the students, it's a big table for the teacher, it's a blackboard, it's homework. That's the school. You have problems with making alternatives, to think alternatively on how to organize efficient learning for many people other than maybe [...] and that's the problem for the students who come today and aren't qualified to take responsibility. They have to train, because it's the whole point of [...] Nobody has asked them "how would you do that? How do you learn best?". And this is so obvious for me! I don't understand why some teachers or why a lot of teachers don't see and understand this. It's completely logical to me.

R1: Don't they give any reasons why they resist so much to that change?

E: No it's the modern [...] we have, it's the modern "ah, I don't have time", but that argument depends on that the teacher should still do the same as s/he did before. That's not valid.

R2: It's difficult to change, it's easier to say "this is the way!".

E: But could we train the teacher to do a job? And in all other jobs, you have to do the job your superior tells you to do, and if you don't do it, 'bye-bye! It's almost impossible to fire a teacher in schools.

R2: And is there a university for teachers?

R1: I think –maybe I'm wrong- that the teachers do not have to go through a pedagogical school in order to become teachers, is that right?

E: Yes, they have to do it in autumn, it's one year. But in primary schools. In upper secondary you have subject education for four, five, six years in the university and then half a year with pedagogical training. And how do you look upon yourself then? As a pedagogue, or as a subject person?

R2: To be a teacher in the secondary school in Spain you have to study the subject. You have to make an exam to be a teacher. The primary school is different.

E: But the teacher education in the teaching places is quite different. And some of them are very traditional in how they train, and that's a problem. But some, for example in Tromsø, have moved quite a bit and have applied a thinking which may lie in all the Norwegian school reforms, [...] education, but there is quite a bit of difference between schools. So they are still making educational teaching which have learnt the old way of being a teacher. In Norway I'm pretty tempted to call the decision-makers cowards, and the fact is that in the public servants the teachers are over-represented in the democratic organs we have in Norway. And in the county government, the county parliament, there are several teachers who think like teachers and forget that they are the public representatives when they are discussing school matters. You have to make some demands to the schools and to the people that go there, to follow the law we have today. If not, they have to get another job in another sector.

APPENDIX B
FIGURES, ENCLOSURES AND TABLES

FIGURES

Fig. 1-2. Hernes

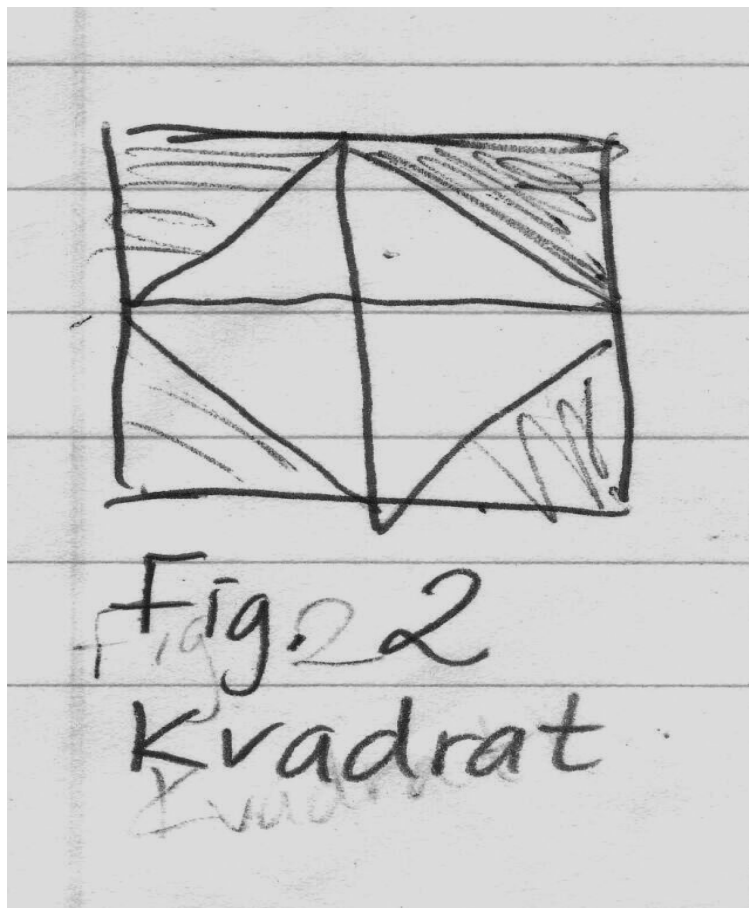
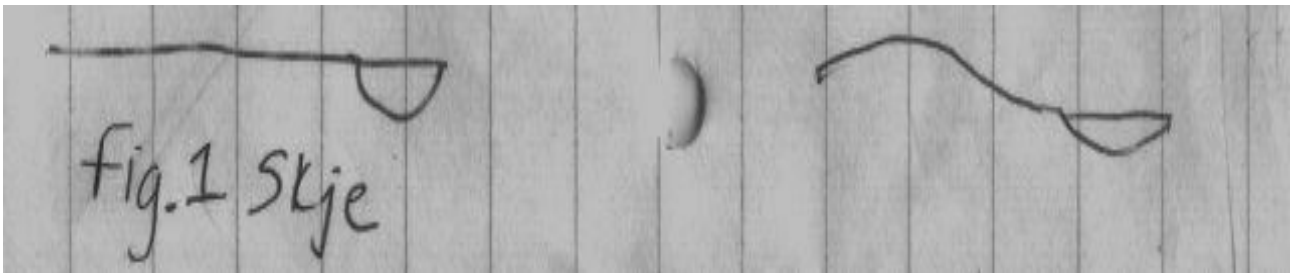
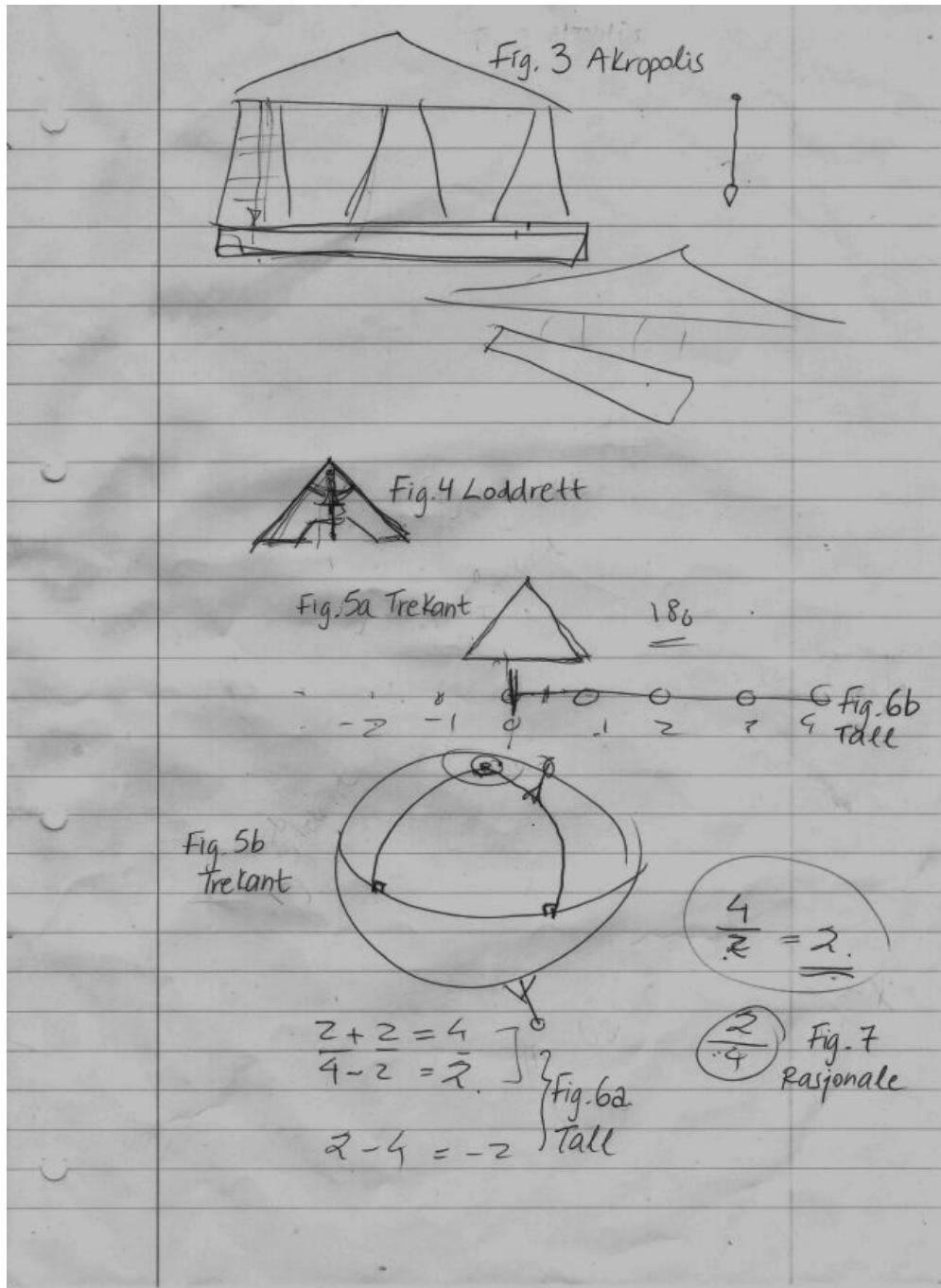


Fig. 3-7. Hernes



VARIOUS ENCLOSURES

1. Information given to the students and teachers – pilot study (translated)

DESCRIPTION OF THE STUDY WITHIN UPPER SECONDARY SCHOOL 1(OR 2)

This study addresses learning and the learning situation at the upper secondary schools. Students and teachers will be asked to describe their own experiences on learning within school; a tape-recorder will be used. After the written transcription of the interviews, the participants will have the opportunity to read the protocols which will be totally anonymous. The interviews will be conducted at school and during school time. They will last ca. three quarters.

Akylina Samara

2. Pre-planned interview questions - pilot study (translated)

A) STUDENTS (1 question per student):

- 1) Please describe with as many details as possible a concrete situation at school time where you faced a problem and had to deal with it. (FO; SCHOOL 2)
- 2) Please describe with as many details as possible a concrete situation at school time where you were taught something difficult and had to understand it. (AA; FO; SCHOOL 2)
- 3) Please describe with as many details as possible a concrete situation at school time where you had to prepare for exams or a test. (AA)
- 4) Please describe with as many details as possible a concrete situation at school time where you had to learn a new technique. (DD).

B) TEACHERS

- 1) Please describe with as many details as possible a concrete situation where you had to teach something totally new. (AA)
- 2) Please describe with as many details as possible a concrete situation where you had to teach a new technique. (FO; DD; SCHOOL 2).
- 3) Please describe with as many details as possible a concrete situation where you had to teach students how to deal with a working problem. (SCHOOL 2).

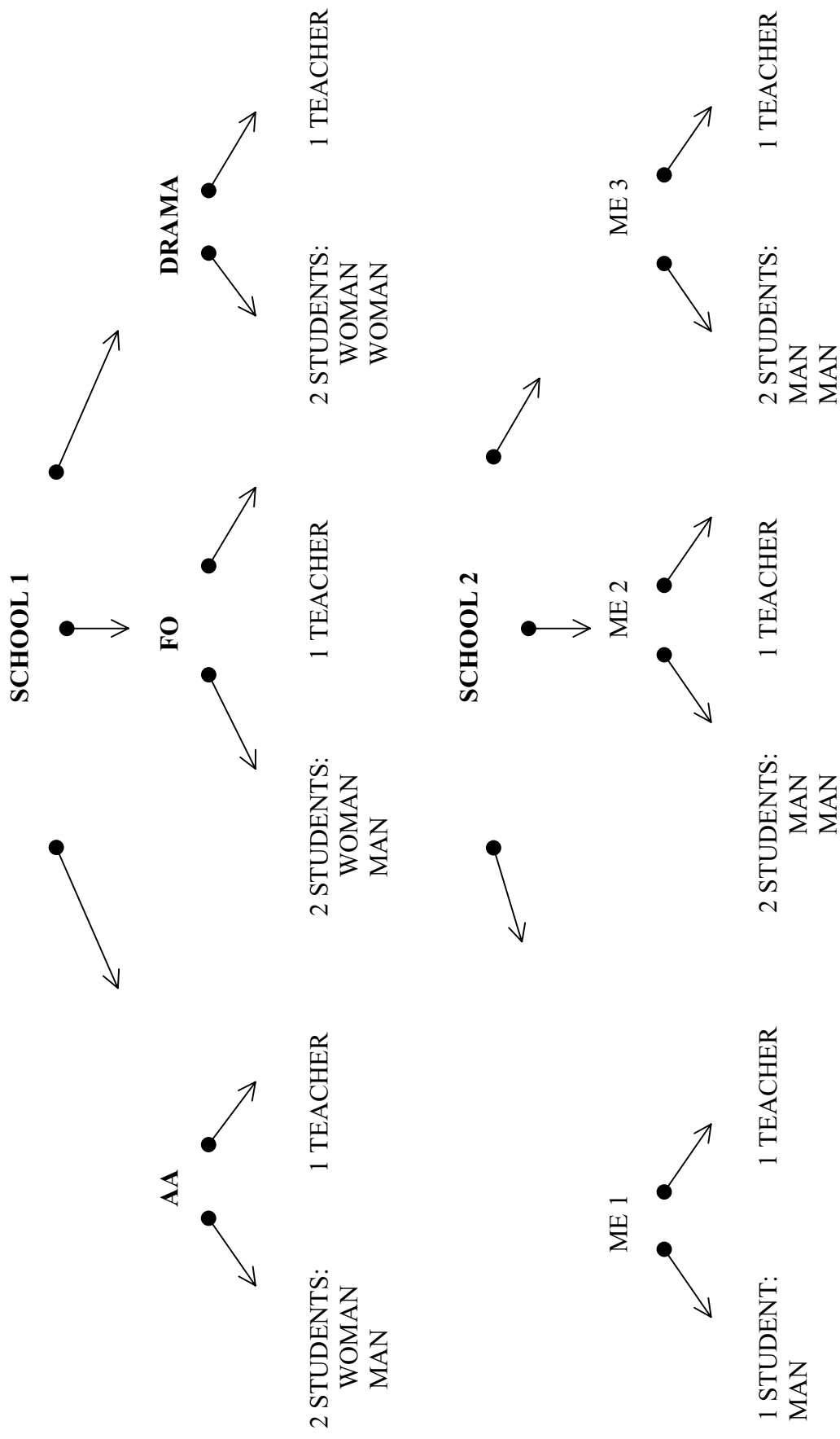
3. Instructions for the written descriptions - pilot study (one question per student - translated)

1. Please describe with as many details as possible a concrete situation at school time where you faced a working problem and had to come with a solution.
2. Please describe with as many details as possible a concrete situation at school time where you were taught something difficult and had to understand it. (2 students)
3. Please describe with as many details as possible a concrete situation where you had to prepare for exams or a test.

4. Paragraphs from the Core Curriculum on critical thinking that all the participants read before the beginning of the interview

1. "Education entails training in thinking –in making conjectures, examining them conceptually, drawing inferences, and reaching verdicts by reasoning, observation and experiments. Its counterpart is practice in expressing oneself concisely –in argument, disputation and demonstration." (Core Curriculum, p. 13)
2. "Critical judgement in different areas of life should be developed by testing expression and performance against specific standards." (Core Curriculum, p. 14).

5. Participants – main study: teachers and students



TABLES

Results

G. Hernes

Critical thinking

PERCEPTION	APPLICATION
<ul style="list-style-type: none"> ◆ Discovery & identification of evaluative criteria ◆ Mental elaboration of criteria ◆ Application of criteria <p>It leads to:</p> <ul style="list-style-type: none"> ◆ comprehension of extant ideas ◆ production of novel ideas ◆ preservation of traditions <p>It requires:</p> <ul style="list-style-type: none"> ◆ awareness of alternatives ◆ personal interest for object & others ◆ familiarity with the situation <p>Contains a 'productive' contradiction.</p>	<ul style="list-style-type: none"> ◆ Examination of familiar situations ◆ Execution of practical assignments ◆ Introduction of theoretical issues with a practical illustration ◆ New knowledge building on old one <p>It depends on:</p> <p>a) the teacher and his/her ability to</p> <ul style="list-style-type: none"> ◆ stimulate the students' interest ◆ make the students aware of their knowledge ◆ present issues gradually ◆ accommodate to the situations/students ◆ illustrate thinking out of conventional frames <p>b) the student and his/her awareness of the knowledge and skills possessed</p> <p>c) the nature of the subject</p>

Pedagogical Leader

Critical thinking

PERCEPTION	APPLICATION	ROLE
◆ Intellectual examination of information	◆ Students' participation in the learning process ◆ Project-work	◆ Examination of the general function of the schools ◆ Use of a report with emphasis on student participation ◆ Advises the schools to apply the guidelines ◆ Only for AA

Learning strategies

TIME	CONTENT	VALUE
◆ During 1 st year. ◆ Instruction adequate for the next years. ◆ Does not require specific information from schools.	General or specific character.	◆ Help students participate actively in the learning process. ◆ Form a basic working method

School 1

Principal

Critical thinking

PERCEPTION	APPLICATION	PRINCIPAL'S ROLE	SCHOOL CULTURE
<ul style="list-style-type: none"> ◆ Intellectual examination of information ◆ Making decisions on working process ◆ Attitude of opposition <p>It requires:</p> <ul style="list-style-type: none"> ◆ relevant knowledge and experience ◆ additional information sources ◆ connections among knowledge areas ◆ attitude of curiosity/interest 	<ul style="list-style-type: none"> ◆ Group/ project-work ◆ Participation in the learning process ◆ Assignments of a practical character <p>It depends on:</p> <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the exam goal ◆ the teacher's attitude 	<ul style="list-style-type: none"> ◆ She is teaching herself. ◆ Close co-operation with teachers 	<ul style="list-style-type: none"> ◆ Especially appointed persons for close contact with teachers & students ◆ Teachers free to design lessons ◆ Teachers co-operate ◆ Especially designed programmes ◆ Student seen as a whole ◆ No different student-teacher status ◆ Problems with AA in applying the core curriculum

Learning strategies

TIME	CONTENT	VALUE
<ul style="list-style-type: none"> ◆ Mainly during 1st year ◆ Repetition in 2nd year. ◆ Up to the individual teachers. 	<ul style="list-style-type: none"> ◆ General character. <p>Directed toward:</p> <ul style="list-style-type: none"> ◆ reading environment ◆ memory enhancement ◆ working conditions 	<ul style="list-style-type: none"> ◆ Help students deal with higher school demands regarding: <ul style="list-style-type: none"> - effort - material

Teachers

Critical thinking

	PERCEPTION	APPLICATION
FO	<ul style="list-style-type: none"> ◆ Theoretical explanation of the practical work ◆ Evaluation of work based on pre-determined criteria & the others' work <p>It requires:</p> <ul style="list-style-type: none"> ◆ knowledge of the central aspects of the working tools <p>It is enabled by the physical proximity in the class</p>	<ul style="list-style-type: none"> ◆ Under 3 types of assessment; criteria: students choose, are given, none specific ◆ Occurs constantly
DD	<ul style="list-style-type: none"> ◆ Analysis of work ◆ Evaluation of work based on objective & subjective standards <p>It requires:</p> <ul style="list-style-type: none"> ◆ experience 	<ul style="list-style-type: none"> ◆ Due to the nature of the subject ◆ Work journals ◆ Observation & participation in work
AA	<ul style="list-style-type: none"> ◆ Autonomous reasoning ◆ Making judgements and contemplating over the process followed <p>It depends on:</p> <ul style="list-style-type: none"> ◆ biological factors 	<ul style="list-style-type: none"> ◆ Execution of debate ◆ Depends on the nature of the subject

Learning strategies

	STUDENTS	TEACHERS
FO	<ul style="list-style-type: none"> ◆ Knowledge of criteria ◆ Consistent work ◆ Practice in communication ◆ Review of previous work 	<ul style="list-style-type: none"> ◆ Explain & analyse goals ◆ Locate the difficulties
DD	<ul style="list-style-type: none"> ◆ Knowledge of evaluative criteria ◆ Pondering over working process ◆ Studying others ◆ Review of previous work 	Advice on group-work
AA	<ul style="list-style-type: none"> ◆ Practice in writing styles ◆ Learning arguments by heart 	<ul style="list-style-type: none"> ◆ Give arguments ◆ Biological limitations

Students

Critical thinking

	PERCEPTION	APPLICATION
FO Female	<ul style="list-style-type: none"> ◆ Evaluation of one's work 	<ul style="list-style-type: none"> ◆ Independent work with evaluating work pieces ◆ Making decisions about work matters
Male	<ul style="list-style-type: none"> ◆ Examination of learning object ◆ Being aware of the central aspects of the working process <p>It requires:</p> <ul style="list-style-type: none"> ◆ previous knowledge ◆ working rules 	<p>Presentation of one's work</p>
DD Female	<ul style="list-style-type: none"> ◆ Examination of information ◆ Evaluation of the work <p>Prepares for criticism (evaluation)</p>	<ul style="list-style-type: none"> ◆ Express one's opinion ◆ Suggest work alternatives
Female	<ul style="list-style-type: none"> ◆ Examination of information ◆ Examination of the working process <p>It requires:</p> <ul style="list-style-type: none"> ◆ favourable milieu 	<ul style="list-style-type: none"> ◆ Evaluation of one's work
AA Female	<ul style="list-style-type: none"> ◆ Examination of information <p>It requires:</p> <ul style="list-style-type: none"> ◆ previous knowledge ◆ favourable milieu ◆ additional information sources 	<ul style="list-style-type: none"> ◆ Identification of causes and consequences of facts ◆ Group-discussion ◆ Participation in main aspects of learning process <p>It depends on:</p> <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the teacher's attitude ◆ the exam type
Male	<ul style="list-style-type: none"> ◆ Examination of information ◆ Evaluation of instruction <p>It requires:</p> <ul style="list-style-type: none"> ◆ effort ◆ knowledge on the area ◆ interest in the area ◆ inquiring attitude ◆ favourable milieu <p>It might involve:</p> <ul style="list-style-type: none"> ◆ risk taking ◆ negative atmosphere 	<ul style="list-style-type: none"> ◆ Working journal ◆ Group-discussion <p>It depends on:</p> <ul style="list-style-type: none"> ◆ the nature of the subject ◆ the teacher's attitude

Learning strategies

	STUDENTS	TEACHERS
FO Female	<ul style="list-style-type: none"> ◆ Reading through, notes, key-words in relation to the goal ◆ Heard only once ◆ Rather demanding ◆ Sporadic use 	<ul style="list-style-type: none"> ◆ When asked: points out what to read. ◆ Regards their instruction unnecessary
Male	<ul style="list-style-type: none"> ◆ Harmonisation with teacher's expectations & learning goals 	<p>Only when asked: further clarification</p>
DD Female	<ul style="list-style-type: none"> ◆ Estimation of time, read once, notes of: important parts & what she lacks knowledge for ◆ Heard once: isolate main theme, skim, gradually go into details ◆ Sporadic use 	<ul style="list-style-type: none"> ◆ Repetition ◆ No encouragement for use
Female	<ul style="list-style-type: none"> ◆ Additional sources, constant work, concentration ◆ No training ◆ Not necessary to use 	<ul style="list-style-type: none"> ◆ No help since their use is not necessary
AA Female	<ul style="list-style-type: none"> ◆ Harmonising with the teacher ◆ Underlying 	<ul style="list-style-type: none"> ◆ No advice due to limited time and amount of material to be covered. ◆ Individual help only when asked: main points
Male	<ul style="list-style-type: none"> ◆ Reading through, important points, additional information. ◆ Has heard about only once ◆ Use of only when aim is to perform well & under important exams 	<p>Only when asked: read through, keep notes</p>

**School 2
Principal**

Critical thinking

PERCEPTION	APPLICATION	PRINCIPAL'S ROLE	SCHOOL CULTURE
<ul style="list-style-type: none"> ◆ Examination of information ◆ Discovery of a solution ◆ Examination of working issues ◆ Evaluation of the instruction <p>It requires:</p> <ul style="list-style-type: none"> ◆ personal everyday experience ◆ knowledge of theory & the working object ◆ activity 	<ul style="list-style-type: none"> ◆ Solving work assignments <p>It depends on:</p> <ul style="list-style-type: none"> ◆ the student's level of training ◆ the students' degree of engagement ◆ the exam goals ◆ the presence/not of learning difficulties <p>It requires:</p> <ul style="list-style-type: none"> ◆ a favourable milieu 	<ul style="list-style-type: none"> ◆ Does not teach herself ◆ Not in close contact with the students ◆ Co-operation with the staff 	<ul style="list-style-type: none"> ◆ The general curriculum includes description of instruction content ◆ Critical thinking not a priority ◆ Especially appointed persons in close contact with teachers ◆ Opportunity for the students to participate in the instruction design ◆ Some teachers are not educated pedagogues ◆ A lot of the students with low school performance/ learning difficulties ◆ Main goal to increase students' enthusiasm ◆ Priority of practice

Learning strategies

TIME	CONTENT	VALUE
<ul style="list-style-type: none"> ◆ Mainly during 1st year ◆ Repetition later up to the individual teachers. 	<ul style="list-style-type: none"> ◆ Closely related to the working object <p>Directed toward:</p> <ul style="list-style-type: none"> ◆ extracting meaning 	<ul style="list-style-type: none"> ◆ Help students deal with demands of the future working life

Teachers

Critical thinking

	PERCEPTION	APPLICATION
1	<ul style="list-style-type: none"> ◆ Common understanding ◆ Various working ways, same result ◆ Evaluation of the teaching/learning method ◆ Attitude of scepticism toward the learning material <p>It requires:</p> <ul style="list-style-type: none"> ◆ experience ◆ practice 	<ul style="list-style-type: none"> ◆ Acquisition of experience ◆ Assessment of learning process & methods <p>It is enabled by:</p> <ul style="list-style-type: none"> ◆ the teacher's learning techniques <p>It developed during the earlier school years.</p>
2	<ul style="list-style-type: none"> ◆ Correct action based on external criteria <p>It requires:</p> <ul style="list-style-type: none"> ◆ experience 	<ul style="list-style-type: none"> ◆ Evaluation of the working situations <p>It depends on:</p> <ul style="list-style-type: none"> ◆ the presence/not of learning difficulties ◆ teacher's techniques
3	<ul style="list-style-type: none"> ◆ Evaluation of the working situation ◆ Choice of correct action <p>It requires:</p> <ul style="list-style-type: none"> ◆ theoretical knowledge ◆ experience ◆ understanding of the factors 	Solve on their own working assignments

Learning strategies

	STUDENTS	TEACHERS
1	<ul style="list-style-type: none"> ◆ Individual & group-work ◆ Observing student-models 	Individual learning techniques
2	<ul style="list-style-type: none"> ◆ Understanding theory-practice ◆ Repetition 	<ul style="list-style-type: none"> ◆ Individual help: clarification ◆ Exchange theory-practice
3	<ul style="list-style-type: none"> ◆ Review of previous exam ◆ Self-assessment 	<ul style="list-style-type: none"> ◆ Guides how to proceed <p>Limitations due to:</p> <ul style="list-style-type: none"> ◆ time restrictions ◆ class structure

Students

Critical thinking

	PERCEPTION	APPLICATION
1 Male	<ul style="list-style-type: none"> ◆ Personal utterances on profession ◆ Self-evaluation of work It requires: <ul style="list-style-type: none"> ◆ personal interest It contributes to: <ul style="list-style-type: none"> ◆ personal insight 	<ul style="list-style-type: none"> ◆ Not particularly encouraged ◆ Only in specific situations
2 Male	Examination of the consequences of one's studying choice	
3 Male	Solving a working problem	Left to work on their own
4 Male	Unknown term	Unknown term
5 Male	Considering the potential hazards at work	Taking action regarding the potential working hazards

Learning strategies

	STUDENTS	TEACHERS
1 Male	<ul style="list-style-type: none"> ◆ Read slowly many times ◆ Find meaning 	<ul style="list-style-type: none"> ◆ Read slowly many times, find meaning ◆ Guide the students to find answers
2 Male	<ul style="list-style-type: none"> ◆ Read through textbooks ◆ Emphasis on particular parts 	<ul style="list-style-type: none"> ◆ Points out which parts to study ◆ Gives the area the exam will be in
3 Male	<ul style="list-style-type: none"> ◆ Comprehension of assignment ◆ Trying out in practice theoretical considerations ◆ Audio tapes and notes of lectures 	Gives answers to extant and potential working problems
4 Male	<ul style="list-style-type: none"> ◆ Reading of the textbook ◆ Notes of essential parts 	◆ No help, only provision of knowledge
5 Male	<ul style="list-style-type: none"> ◆ Studying in a quiet environment ◆ Keeps notes 	<ul style="list-style-type: none"> ◆ Study in quiet environment ◆ Further explanation of unclear points