

James Karlsen

The Regional Role of the University

**A Study of Knowledge Creation in the Agora between
Agder University College and Regional Actors in Agder,
Norway**

Thesis for the degree of doctor philosophiae

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Norwegian University of Science and Technology
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Department of Industrial Economy and Technology Management

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Summary

In the age of the “knowledge society” and “knowledge economy” the main institution for the development of knowledge, the university, is being challenged in the general discourse in society as well as in specific regions. This somewhat paradoxical situation is the background for my study of the regional role of university.

My assumption is that in order for universities to meet this challenge, it is important that they develop their *knowing how* in *cogenerative knowledge creation processes* in the *agora* between university and regional actors, such as industry. By *agora* I mean the concrete knowledge creation processes between university and regional actors. However, there is little theoretical knowledge about the processes in the *agora*. The processes are like a black box in theories that discuss the regional role of university.

Subsequently my main research question is:

- *How is knowledge created in the agora between a regional university and regional actors?*

In order to answer this question I present, first of all, a theoretical discussion of concepts such as knowledge, knowing how, the *agora*, the legitimacy of university, regional innovation systems, action research and the regional role of university. This discussion concludes with an analytical model and a typology for analysing knowledge creation processes. The model consists of the following elements: participants, planning and organization of the process, and cogeneration of knowledge. By analysing these organisational elements I will be able to say something about different types of structures of the knowledge creation *process* among the actors in the *agora*. The typology I have developed from these observations has the following four kinds of processes: Strategically organized processes, management organized processes, collectively research-organised processes and individually research-organized processes.

As a way of illustrating and illuminating my research question I look into knowledge creation processes between Agder University College and regional actors in the Agder region in Norway. The processes I have studied are diverse. The *agora* consists of many different

knowledge creation processes: some are small, some are big, some are ad hoc organized and some are regularly organized and last for a long time, some are reported in the media while others are not so easy to identify. The regional role of university has so far been interpreted through top-down initiatives, such as strategically organized initiatives and management organized initiatives. However, the top-down processes have only to a limited extent been connected to bottom-up processes that are organized by researchers in the university college. This connection is crucial if Agder University College is to interpret its regional role successfully.

During the last quarter of the twentieth century universities around the world found themselves under increasing pressure to change the way they operate. Alert universities gradually recognized that they had to respond to proliferating new demands for government, industry and societal groups, while maintaining and improving their traditional fields of research, teaching and student learning that became more complicated with every passing year...But many universities seemed unable to keep apace fast moving times... Instead, deliberately or unconsciously, they would opt for the comfort of standing still (Clark 2004: 1).

1. Introduction

I start with an assumption that it is important for regional universities to develop their *knowing how* in *cogenerative knowledge creation processes* in the agora between university and regional actors, such as industry. Given this assumption my thesis is that different types of knowledge creation processes are critical for the knowledge development between university and regional actors. The regional role of university is played out in the agora between university and regional actors. This statement is founded in a study of regional knowledge creation processes between a regional university college and regional actors. The university college I study is Agder University College and the region is the Agder region, which is the most southern region in Norway.

The reason for the importance for universities to develop their *knowing how* in *cogenerative knowledge creation processes* with regional actors is that universities world wide are subject to the pressure of change with new demands, which they can react proactively to, or stand still, in the hope that the change will not affect them (Clark 2004). Also university colleges, such as Agder University College, which have been sheltered from their surrounding regions, are now exposed to demands from regional actors.

One argument for the new demands on universities is that the economy has gone through a qualitative shift, in the last quarter of the twentieth century, from an economy based on industry to a economy based on information (Castells 2000) and theoretical knowledge (Bell 1974). Castells has labelled this new period the *Information Age* (Castells 2000), while Bell (1974) has used the label the *Knowledge Economy*. The argument from the authors is that the use of information and theoretical knowledge has increased in the economy and is more important than in earlier societies and economies. My contribution to this debate or discourse

is to discuss the knowledge concept, and use it in the subsequent analysis of Agder University College's regional role. I do not intend to discuss other questions, such as whether today's society is more knowledge intensive than earlier societies were. I therefore use quotation marks when I use the concepts "knowledge economy" or "knowledge society".

The increased use of information and knowledge has contributed to increased attention for the role of university in economic development and regional development. Universities have for a long time contributed with knowledge to society both by supplying the labour market with a well-qualified work force, and through technology transfer to society. The new demands are that universities are expected to contribute more directly with their knowledge in the effort to increase the nation's and the region's innovative capacity and competitiveness. The demand is that universities must collaborate with actors, such as industry in knowledge creation processes (Gibbons, Limoges, Nowotny, Schwartzmann, Scott, and Trow 1994; Etzkowitz and Leydesdorff 1997; Nowotny, Scott, and Gibbons 2001; Brulin 2004). The expectations are not only directed at the natural sciences and technology, but include also the social sciences and the humanities. The demands include a change from a disciplinary to a transdisciplinary approach where knowledge is created in a context of application with the users of knowledge (Nowotny *et al.* 2001). There has been a change in the dominant mode of knowledge creation in society, which now challenges universities (Gibbons *et al.* 1994; Nowotny *et al.* 2001). The argument, coined by Gibbons *et al.* (1994), is that the mode of knowledge creation in society has changed from Mode-1 knowledge creation to Mode-2 knowledge creation.³ The authors argue that Mode-2 knowledge creation is more in line with the needs in the "knowledge economy". Universities, which traditionally have been creating knowledge in Mode-1, risk the fate of losing in the competition with knowledge producers in society that create in Mode-2 (Nowotny *et al.* 2001).

The challenge of university can be traced in, for example, legislation dealing with the universities. In Norway the legislation for university and colleges has been changed twice this century. In 2002 the legislation for the first time mentioned cooperation by universities with society and industry, in addition to statements about education, research and distribution transfer of knowledge to society. In 2005 the legislation was expanded with more

³ The authors use the concept knowledge production. I prefer the term knowledge creation because I regard creation of knowledge as a creative process. Production is for me a more instrumental and mechanical process.

expectations concerning the economic role of university in society. Points of relevance for the regional role of university are that university shall:

[Contribute] to innovation and value creation on the basis of the results of research and academic and artistic development work. [Cooperate] with other universities, university colleges and corresponding institutions in other countries, local and regional civic and working life, public administration and international organisations. (Act relating to Universities and University Colleges 2005, Section 1-3, e and h. English translation taken from www.lovdatab.no)

In many regions universities and university colleges are challenged by regional actors that want them to participate more in knowledge creation processes in their host region, and especially with industry (Chatterton and Goddard 2000; Brulin 2001; Etzkowitz and Leydesdorff 2001; Greenwood and Levin 2001; Nowotny *et al.* 2001; Lantz and Totterdill 2004; Levin 2007; Nilsson, Aarbo, Dahl, Dahlum, Edvardsdson, Eskelinen, Nielsen, Uhlin, and Ylinenpää 2007). Some authors argue that this is a new mission for university; a third role or a regional development role (Chatterton and Goddard 2000; Brulin 2001; Brulin 2004; Lantz and Totterdill 2004; Levin 2007), in addition to the other roles involving education and research. The ideas about a more active role for universities are discussed in greater depth by authors such as:

- Burton Clark with his concept of entrepreneurial universities (Clark 1998; Clark 2004),
- Helga Nowotny, Peter Scott and Michael Gibbons with their Mode-2 concept (Gibbons *et al.* 1994) and their follow-up book *Re-Thinking Science* (Nowotny *et al.* 2001),
- Henry Etzkowitz and Loet Leydesdorff with their Triple Helix between university, government and industry (Etzkowitz and Leydesdorff 1997).

In addition to the above contributions, the *Regional Innovation Systems* (RIS) approach (Braczyk, Cooke, and Heidenreich 1998) has incorporated the role of higher education and research as an element in the model. Despite the increased interest in the role of university there have been few empirical studies done of regional universities. One such study is *The Role of Universities in Regional Innovation Systems* (Nilsson *et al.* 2007), which is a comparative study of different universities in the Nordic countries. The study shows that universities have played different roles in different regions at different times. Historical

nuances and locally specific conditions play a strong role in the regional impact of each university (Nilsson *et al.* 2007).

The above approaches state the importance of university and knowledge in relation to economic development in society and in regions. However, they are less clear on how knowledge actually is created between a regional university and regional actors. There is a tendency that they “black box” knowledge creation processes between university and regional actors, such as industry.

The word black box is used by cyberneticians whenever a piece of machinery or set of commands is too complex. In its place they draw a little box about which they need to know nothing but its input and output (Latour 1987: 3)

There is a need to supplement system analysis with an analysis of knowledge creation processes done inside-out and bottom-up. Knowledge creation processes are organized processes with different participants from university, such as researchers, students and management, and different regional participants, such as different kinds of companies, and the public sector. The participants meet each other with the aim of creating knowledge. I will use the ancient Greek concept of *agora* to denote this meeting. In the following I will use the concept *agora*, in a singular form. The agora is an abstract concept that denotes concrete knowledge creation processes between university and regional actors. The *agora* is the public space where “science meets the public” (Nowotny *et al.* 2001).

The agora is the space in which societal and scientific problems are framed and defined, and where what will be accepted as “solutions” is being negotiated (Nowotny *et al.* 2001: 247).

The regional role of university is played out in the agora. The knowledge creation processes in the agora are a result of the meeting between different institutions, between different organizations, between people who represent different organizations, and between people with different kinds of knowledge. Knowledge creation is a social process (Berger and Luckmann 1966).

I assume that university is a complex organization, which participates in the agora with other complex organizations from the region. To capture this complexity I have created a typology with four different kinds of processes in the agora; cf. table 1 below. The first dimension of the typology differentiates between two main actors in university; management and

researcher. The second dimension differentiates between collectively organized processes and individually organised processes. Strategically organized processes are processes initiated by the board, while management organised processes are processes initiated by university college directors. Collectively research organized processes are at the core of university with research and education. Individually research organised are processes initiated by the individual researcher. The typology gives a more nuanced approach to the discussion of the regional role of university. I will present the content of the table below in greater depth in chapter five together with a model for organizational design of knowledge creation processes in the agora.

Table 1: Four different kinds of processes in the agora

Actor	Management	Researcher
Organizational design		
Collective	I. Strategically organized processes	III. Collectively research organized processes
Individual	II. Management organized processes	IV: Individually research organized processes

Knowledge creation processes are events that are restricted in time and that happen in specific places in space. Knowledge creation processes in the agora are not necessarily of the same kind as processes in university (Gibbons *et al.* 1994; Nowotny *et al.* 2001). The problem is that the same concept often is used to denote different processes. Another problem is that the knowledge concept often is used to denote both knowledge creation processes and outcomes of such processes. This creates an ambiguity in the concept:

does it mean a process, or the results of a process? (Gourlay 2004: 93)

This imprecise and un-nuanced use of the knowledge concept makes it necessary to explore the distinction between knowledge as a process, i.e. as knowing, and knowledge as a product in order to understand knowledge creation processes in the agora. Knowledge as a product is knowledge that has been codified, such as theoretical knowledge. In the following I will use the concept *knowing how* to denote the organization of knowledge creation processes in the

agora. Universities need to develop their knowing how in cogeneration of knowledge with regional actors (Levin 2007).

My earlier discussion of the regional role of university and the knowledge concept leads to my main research questions, of which the most important one is:

1. *How is knowledge created in the agora between a regional university and regional actors?*

I will divide the main question into three more concrete questions:

- a. *What* main forms of knowledge are created in the different processes? The ambiguity of the term knowledge creation makes it necessary to examine the term more closely.
- b. *Why* is University College by society and by regional actors? A challenge can be formulated in different ways and with different arguments. Whatever the formulation of the challenge, there is a need to know more about the arguments behind the challenge.
- c. *How* are knowledge creations processes in the agora between university and region organised? The assumption of a complex organization implies a diversity of processes in the agora, which in turn implies a theoretical discussion of how such processes can be analysed.

In order to answer the three questions I will first discuss them more thoroughly theoretically. I will end the theoretical discussion in chapter five by created a model for analysing knowledge creation processes. As a way of illustrating and illuminating the above questions, I want to look into knowledge creation processes between Agder University College and actors in the Agder region. In chapter six I will present the Agder region and Agder University College more thoroughly. I will therefore just briefly mention that the Agder region is the most southern region of Norway, not far from Denmark. It is a small region with 260,000 inhabitants. Agder University College is one of 25 public university Colleges in Norway and is in a process of becoming a university. Norway has six universities.

In order to answer the above questions I will now present the methodological approach I have chosen, which has guided the structure of my study from a systems approach and into concrete knowledge creation processes in the agora.

1.1 Methodology and structure of the study

I define methodology as the creation of knowledge (Arbnor and Bjerke 1997). The formulation of the research thesis, the selection and discussions of theories, and the generation and analysis of data are all shaped by the methodological approach I position myself within, which is a systems approach in combination with the actors approach. The reason is that I am interested in exploring how processes unfold within a system, such as the regional innovation system.

The *systems approach* views reality as objective and explanation is seen as the lodestar, but reality and the actors are not necessarily seen as rational (Arbnor and Bjerke 1997). People may say that they act rationally, but a study of their actions shows that there is a difference between what they say and what they do. The *actors approach* views reality to be subjective and relative, knowledge as understanding is the lodestar and results that are concrete and specific are sought. This approach is interested in understanding the meaning behind the actions done by individuals in society. The whole exists only as meaning structures that are socially constructed. Knowledge depends on individuals (Arbnor and Bjerke 1997).

The actors approach and the systems approach rest on different conceptions of reality, and are often lined up as each other's opposites. Delanty (1997) argues that this is a false dichotomy; they are only exclusive if they are conceived naively. A naïve actor approach does not acknowledge that behind the constructs of social actors there are objective realities. A naïve systems approach neglects the fact that social actors and science construct reality. Delanty (1997) argues in favour of a more reflexive account of knowledge creation that:

'investigates how self-evidence is produced, how questions are curtailed, how alternative interpretations are shut up in black boxes and so on'; in other words, it examines how reality is constructed by social actors who define what is to count as knowledge (Delanty 1997: 133).

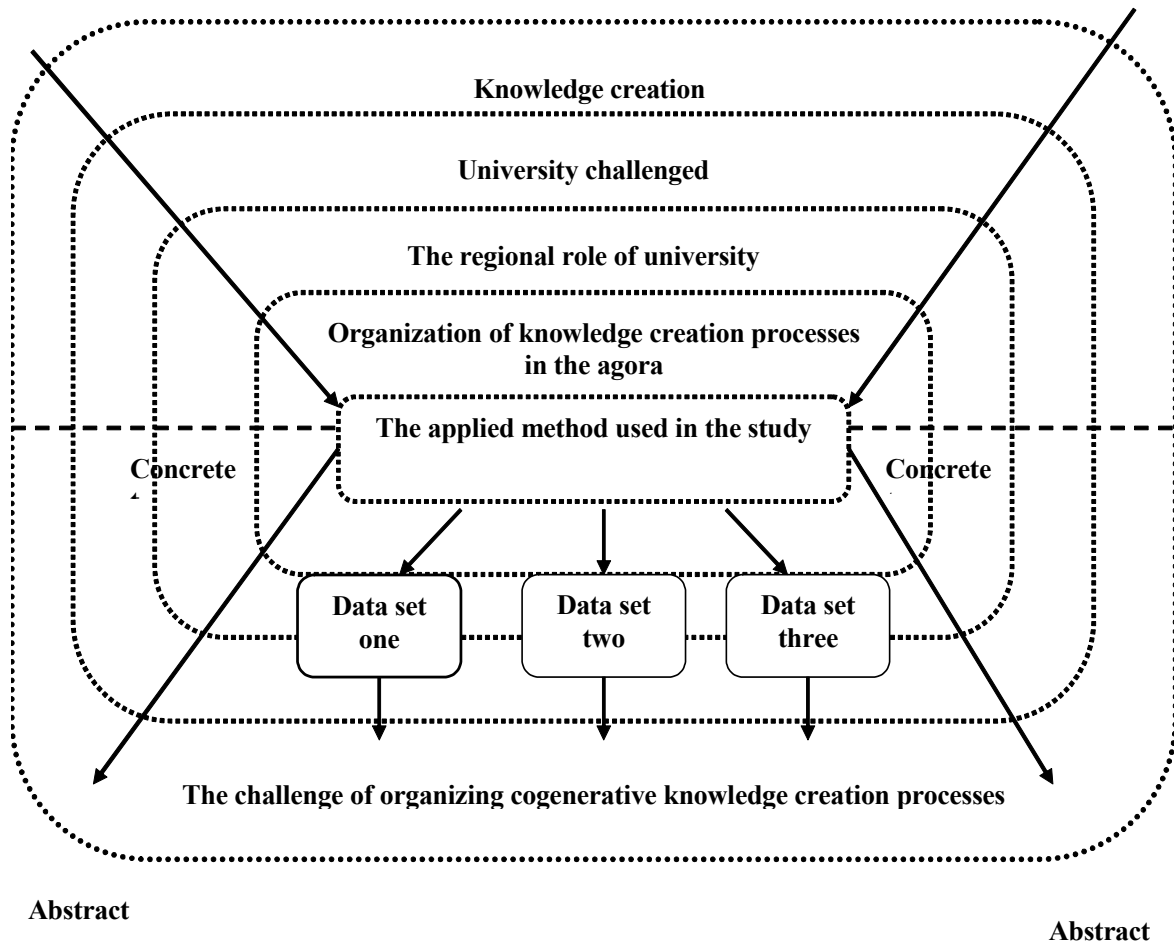
This is in line with hermeneutics, which critically examine how knowledge about a particular meaning is constructed. The hermeneutic argument is that there is not a one to one correspondence between reality and language in such a way that reality can be expressed in a simple and straightforward manner. The meaning of words is not fixed and universal but is established through their relations with other words. Every word we use to understand the complexities in the world and the words we use in an explanation are packed full of meaning. This means that there is not a simple and neutral act of perception. Experiences and social phenomena are socially created as representations in specific discourses (through language, text and symbols) i.e. as meanings. The representation through language is between the real world and our perception of it. This implies that theories and concepts must be carefully examined because they are constructed through language. Examination and discussion of concepts is important because our concepts are likely to be superficial or chaotic (Sayer 1992).

I will use the actors approach in the data analysis. This approach is critical of other approaches that take for granted that reason produces truth, that truth is a guide for good social practice and that the theories are not influenced by the individual social scientist's own values. Truth is seen as only one of at least several perspectives or representations of reality. The approach is focused on the conditions that establish something as truth, i.e. how truth is socially produced, reproduced, how the truth searching processes or discourses function, which effects they have, which methods or techniques they use and so on. There is no direct link between reality and thought, and the social sciences cannot be based on what is described as objective truth. A discourse is about both language and practice. Through the discourse a topic is constructed. A discourse defines and produces the object of our knowledge and what can be said and reasoned meaningfully about, and what is not a topic (Foucault 1972). The focus in a discourse is the use of words. Means and ends are not possible to distinguish from each other; they are interwoven in each other. The discourse is ongoing, fluid, context dependent, symbolic, undetermined, and open-ended. The aim of the interpretation is to discover and understand new meanings in the discourse.

Knowledge creation in the systems approach implies a discussion that starts with an abstract discussion of concepts, which step by step moves towards a more concrete discussion, and then a discussion of the actors' meaning and meaning construction, before the discussion moves back towards a more abstract discussion. This is done through abstraction and

discussion of relationships between elements in a system. This is the reason for my theoretical discussion, and guides the structure of this study. In the figure below the steps are symbolised. The aim is to make the discussion more and more concrete towards the method chapter.

Figure 1: The structure of the study



Chapter two to five are my theoretical chapters. In chapter two I will discuss the knowledge concept and knowledge creation. In the chapter I distinguish between knowledge and knowing. I explore the distinction between data, information and theoretical knowledge. In the same chapter I discuss the connection between knowing how and tacit knowing. In chapter three I will discuss the current challenge for university, which is said to come from a new mode of knowledge creation in society. A new legitimacy of university is emerging and challenging the Humboldtian ideals for knowledge creation in university. Both the Mode-2 concept and the agora will be presented in the chapter. In chapter four I will present and

discuss regional development theories and the regional role of university. In chapter five I will discuss how knowledge creation processes in the agora can be organized and I will present action research, which is the method I have used to generate data. The concept cogeneration of knowledge and the model for analysing knowledge creation processes in the agora will also be presented.

Chapter six is a presentation of how I have generated the data. I have used a narrative style to describe how I have generated the data in the chapter. The data and my findings are organized in three data sets in chapter seven, eight and nine. Chapter seven presents the regional challenge of Agder University College. Chapter eight is a mapping of s knowledge creation processes in the agora between Agder University College and regional actors. Chapter nine is a thorough investigation into two knowledge creation processes between Agder University College and industry. Chapter ten summarises the main findings and discusses them.

2. Knowledge creation

My aim with this chapter is to discuss the knowledge concept from the perspective of knowledge creation. This question has inspired philosophers, sociologists and economists to explore and use the concept. My intention is not to follow the philosophical path, but to demonstrate the vagueness and ambiguity of the knowledge concept on the one hand, and on the other hand indicate my position and my understanding of the concept. The reason is that knowledge is a much used concept, and the concept is also used to denote the current economy and society; i.e. the “knowledge economy” and the “knowledge society”.

I will start the discussion by introducing the knowledge discourse and the ambiguity in the knowledge concept. I will then discuss knowledge creation, followed by a discussion of the distinction between data, information and knowledge. Knowing how and tacit knowing are the next concepts for examination before I end the chapter with a discussion and a summary

2.1 The knowledge discourse

Today it is hard to read a newspaper, listen to a radio programme or watch television or open a new book without meeting the words information and knowledge. They are ubiquitous.

There seems to be a widespread consensus among many authors (Bell 1974; Drucker 1993; Amin 1994; Gibbons *et al.* 1994; Nonaka and Takeuchi 1995; Knorr-Cetina 1999; Castells 2000; Nowotny *et al.* 2001) that present-day Western societies in one sense or another are ruled by knowledge and expertise. Both Bell (1974), Drucker (1993) and Amin (1994) argue that knowledge has become a productive force that makes today’s society “post-industrial”, “post-capitalist” or “post-Fordist”. The labels “knowledge society” and “knowledge economy” are used to denote the dependency on and domination of knowledge. The above authors argue that there has been a transition from an earlier industrial society to a society dependent on knowledge since the 1970s. Bell (1974) argues for the transition by using statistics where he shows the effects of knowledge on the economy. Observable tendencies include the shift in the division of labour, the increase in specialised knowledge workers, the increase in people with higher education, and the development of new knowledge based companies. The tendency identified by Bell has later been further elaborated by (Castells 2000). He prefers the concept of information in his analysis of the network society. He talks

about the increase in the amount of use of data and information in society and named the current period as the *Information Age*.

Devlin (1999) argues that since 1995 there has been a trend towards substituting the word information with the word knowledge. In economics literature the concept is often used to denote the dominating mode of production in the current economy; i.e. the “knowledge economy” (Bell 1974; Drucker 1993; Castells 2000). In this literature knowledge is regarded as a means and an economic instrument to increase innovation (e.g. Amin 1994; Braczyk *et al.* 1998; Asheim 2006), manage the public sector more efficiently (Pollitt 1993) or reduce costs. The concept is also used in a variety of combinations with other concepts such as knowledge management (Fuller 2002; Styhre 2003), the knowledge creation company (Nonaka and Takeuchi 1995), and working knowledge (Davenport and Prusak 1998). The concepts all point towards the usefulness of knowledge, i.e. that knowledge must have a useful purpose.

However, if one tries find out what knowledge is, the meaning and the use of the concept become more blurred. The concept is used in a rather eclectic manner (Knorr-Cetina 1999), and the same concept seems to imply a multiple of meanings. This makes the concept difficult to use with any precise meaning and for a precise purpose. The philosopher John Dewey and his polymath Arthur Bentley in their writings from 1949 argued that knowledge is a loose term that should be avoided. The word should be placed on the top of the list of “vague words” (Dewey and Bentley 1975). However, it is difficult to avoid using the word, since it is also used as an analytical concept. Dewey and Bentley (1975) therefore concluded that:

only through a prolonged inquiry can the word knowledge be given a determinable status with respect to such questions as: (1) the range of its application to human or animal behaviour; (2) the type of its distribution between knowers, knowns, and the presumptive intermediaries; (3) the possible locations implied for knowledge as present in time and space (Dewey and Bentley 1975: 48).

Dewey and Bentley’s recommendation is still relevant, but today’s extended use of the concept makes it hard to avoid using it. Whether one likes or does not like the labels “knowledge economy” or “knowledge society” it is hard nowadays to avoid the concepts. My contribution to the knowledge discourse is to discuss the knowledge concept, and use it in the subsequent analysis of Agder University College’s regional role. I do not intend to discuss

other questions, such as whether today's society is more knowledge intensive than earlier societies were. I therefore use quotation marks when I use the concepts "knowledge economy" or "knowledge society".

I will discuss the knowledge concept along two dimensions: as a process, and as a substance; i.e. as an output from a process. My argument is that there is a difference between data, information and theoretical knowledge on the one hand and knowledge creation on the other hand. The distinction between data, information and theoretical knowledge is thin and sharp; it is a matter of degree. The distinction between the former concepts and knowledge creation is not a matter of degree, but of kind or type. Knowledge creation cannot be reduced to theoretical knowledge.

In English the word knowledge is a noun, while knowing is a form of the verb know. As a noun knowledge can be interpreted as something solid, as a substance. As a verb, knowing can be interpreted as an action or process. Knowledge presupposes a fixed point in time where some insight or belief qualifies as knowledge, while knowing is what continuously unfolds as we make use of knowledge in action (Styhre 2003). The distinction between knowledge and knowing is more than a grammatical discussion. It gives the concept an ambiguity (Gourlay 2004).

The distinction between knowledge as a substance and knowing as a process has a long history and can be traced back to the ancient philosophers Democritus and Heraclitus (Rescher 1996). According to Democritus, processes are a function of change between solid substances in time and space. The smallest substances he called atoms. The substances do not change, only the relations between them, which initiates change. Heraclitus on the other hand viewed reality as a constellation of processes, and not of things. The fundamental issue in nature is processes and material substances are a result of processes. Heraclitus argued that substantializing nature into enduring things or substances is a fallacy, because they are produced by varied and fluctuating activities (Rescher 2000: 5).

Process is fundamental: the river is not an object, but a continuing flow; the sun is not a thing, but an enduring fire. Everything is a matter of process, of activity, of change (*panta rhei*). Not stable things, but fundamental forces and the varied and fluctuating activities they manifest constitute the world (Rescher 1996).

Process ontology reverses the substance ontology's relation between things and processes. Processes create substance; i.e. substances are both the products and the manifestations of processes. Substance ontology makes ontology a passive category with epistemological consequences for knowledge construction and creation. On the other hand, process ontology makes ontology active, concerning becoming, and not simply being. In process ontology flow, flux, and change are the fundamental processes of the world, and the future is open, unknowable in principle, and it always holds the possibility of surprise (Rescher 2000). Processes are temporal with a developmental, forward-looking aspect, linked together, and develop over time. Processes' temporality means that processes can start, end, and change.

Today's mainstream philosophy and social research support Democritus' ontology (Van de Ven and Poole 2005: 1378). My intention is not to give a philosophical answer to the discussion between Democritus and Heraclitus, but to connect the ambiguity in the knowledge concept to knowledge creation.

2.2 Knowledge creation

Creation of new knowledge has inspired many philosophers, such as Plato. In *Meno*, he states the paradox about knowledge as a hidden reality that can be uncovered by man. The contradiction is that the search for a solution of a problem is an absurdity. For either you know what you are looking for, and then there is no problem; or you do not know what you are searching for and then you cannot expect to find anything. Plato's solution of the paradox was that we had lived before, and that all discoveries are a remembering of past lives. Polanyi (1966) offers the solution that we can uncover hidden knowledge, because we have a tacit foreknowledge of yet undiscovered things. The philosopher Bergson presents an alternative explanation.⁴ He distinguishes between two kinds of knowledge, intellect and intuition, which he argues are complementary.

Intelligence, in so far as it is innate, is the knowledge of form; instinct implies the knowledge of a matter. ... There are things that intelligence alone is able to seek, but which, by itself, it will never find. These things could be found by instinct alone, but it will never seek them (Bergson 1998: 149: 149).

⁴ Bergson is regarded as a process philosopher (Van de Ven and Poole 2005).

Intelligence is the capacity to try to represent or understand a reality through concepts, by arranging and rearranging them until a practical equivalent of the reality is obtained. The problem with intelligence and thinking in abstract concepts is that reality is constructed as solid entities in stable configurations with relations between them. Intelligence is the kind of knowledge used to construct what is perceived as reality. Intelligence has no capacity to think in process and movement, and will therefore try to make movement and process something solid. Bergson distinguished between two forms of time: real time and mathematical time. Real time is pure duration as we experience it. It is continuous and indivisible. Mathematical time is measurable duration, which can be divided into units or intervals. However, mathematical time does not reflect the flow of real time. According to Bergson, real time cannot be analyzed mathematically. To measure time is to try to create a break in time, and freeze time. In order to try to understand the flow of time, the intellect forms concepts of time consisting of defined moments or intervals. However, the intellectual way of creating knowledge does not grasp the real experience of time; this can only be known by intuition.

Intuition is the capacity to think in process and movement. Intuition is also the capacity to create something new, which has not necessarily an external representation. According to Bergson intuition cannot be explained by the intellect, which makes Bergson's arguments suspicious for the scientist that wants clearcut categories and concepts.

Bergson (1992) argues that intelligence dominates over intuition in science, and that this limits the possibility of science. Intuition is less used, which means that the human mind is not used sufficiently. Thinking intelligently usually consists of passing from concept to things, and not from things to concepts. Bergson argued that action is prior to philosophy, and that what philosophy can offer is an analysis of how knowledge is constituted; i.e. how knowledge is constructed. No image or concept can substitute the experience and feeling for action or as Bergson (1999) frames it:

No image can reproduce exactly the original feeling I have of the flow of my own conscious life
(Bergson 1999: 27).

Bergson's (1999) argument is that there is no means of reconstructing the mobility of the process with fixed concepts, since language operates with already fixed concepts. Every language leaves many more things to be understood than it is able to express. There is an ambiguous relationship between a process and the words used to express the experience from

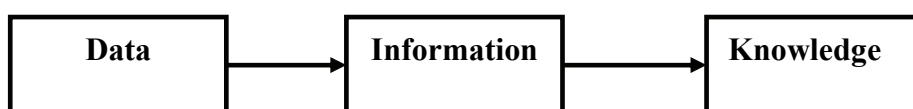
such a process. A process is hard to grasp with words. The words do not represent the dynamic character of a process. When words are used, they become entities, and do not represent the fluid and temporary character of a process. Therefore it is difficult to represent intuition and creation of knowledge with words. I regard a process, such as a dissertation, as a combination of intellect and intuition. Both are needed in the process. The intellect is useful to structure an argument, in form of words and sentences, while intuition gives the possibility of seeing new perspectives. In this study I will use the concept *knowledge creation* because I consider that knowledge is an action by man using both intuition and intellect.

The next step I will take is to follow the intellectual path and trace the distinction between data, information and knowledge. The concepts are often used in management and organizational literature and by economists, and sometimes they are used interchangeably.

2.3 The difference between theoretical knowledge and knowledge creation

I will now explore the distinction in the following and compare my understanding with the analytical approach, which seems to rest on the assumption that there is a linear and directional continuum between data, information and knowledge. This understanding is founded in a rationalistic epistemology, which I do not share, as mentioned before, where knowledge is assumed to be a stock accumulated with an information flux (Amin and Cohendet 2004: 18). In this epistemology knowledge is defined as “justified true belief”, which supposes a split between the knower and the known. This implies a “spectator” theory of knowledge that separates theory and practice, such as in economics where economic knowledge is separated from the subject (Amin and Cohendet 2004). It also implies that individual beliefs are given and remain unchanged through the search for truth. In the figure below the unidirectional process between the concepts is demonstrated.

Figure 2: The unidirectional process of knowledge creation



In the rationalistic view data is the smallest piece or entity in this construction, and is often defined as a set of discrete, objective facts about events (Davenport and Prusak 1998; Devlin 1999). Devlin (1999) further adds to the definition that data is what newspapers, reports, and “computer information systems” provide us with, such as a list of stock prices in a newspaper. Davenport and Prusak (1998) use an example of a customer who fills the tank in his car with gas. The transaction can be partly described by data, such as when he was at the gas station, how much gas he filled and what he paid, but the data does not say anything about why he went to exactly that station and not another one and does not say if he will ever go back there.

The next building brick in the rationalistic view is information, where data is regarded as raw material for the creation of information (Davenport and Prusak 1998). Information is defined as data endowed with relevance and purpose (Davenport and Prusak 1998; Devlin 1999). In the Middle Ages information was defined as the transformation or communication of one material form to another form (Fuller 2002: 16). Information is a message, from a sender to a receiver, usually in the form of a document or an audible or visible communication, which makes a difference for the receiver of the information (Davenport and Prusak 1998). Information conveys meaning to the person who reads it (Nonaka and Takeuchi 1995). Data becomes information when its creator adds meaning to the data (Davenport and Prusak 1998). The rationalistic view further argues that information can be stored in, for example, books, manuals and databases, and can be studied independently of its use (Devlin 1999). This makes information to data that has been organised and communicated (Castells 2000: 17).

So far, I have no trouble with the rationalistic view, but the next step I do not support. Davenport and Prusak (1998) offer what they call a working and pragmatic definition of knowledge both for individuals and for organizations:

Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms (Davenport and Prusak 1998: 5).

The authors argue that the definition highlights the dynamic character of knowledge as an outcome of a process, a “framework”, and a process for “incorporating new experiences and information”. However, Tsoukas (2005) argues critically about the authors’ definition:

... it is not clear in what sense knowledge is different from information, nor how it is possible for values and contextual information to originate and apply in the minds of individuals alone. Moreover, Davenport and Prusak pack into knowledge too many things, such as ‘values’, ‘experiences’, and ‘contexts’, without specifying their relationships, thus risking making ‘knowledge’ an all-encompassing, and, therefore, little-revealing concept (Tsoukas 2005: 118).

Tsoukas (2005) argues that Bell (1999) offers a more elaborated understanding of knowledge. Bell includes judgement as a part of the process of knowledge formation. Even the smallest piece of data requires some human judgement, while knowledge requires maximum human judgement (Bell 1999; Tsoukas 2005). Knowledge is the capacity to exercise judgement, or as Bell (1999) argues:

Knowledge is the capacity to exercise judgement on the part of an individual, which is either based on an appreciation of context or is derived from theory, or both (Bell 1999: lxiv)

Bell (1999) argues that judgement is the self-conscious use of the prefix *re*: to re-order, to re-arrange, and to re-design what one knows and create new data, new information and new knowledge (Tsoukas 2005). The capacity of exercising judgement implies the capability of drawing distinctions between “this” and “that” (Tsoukas 2005). By making distinctions the constituent part of a phenomenon of study is brought into consciousness. Tsoukas (2005) argues that the way we do this is through language, through naming and re-naming a phenomenon of study in a process of making finer and finer distinctions. If our language is used in a general and unsophisticated way this will influence our distinctions and judgement, and our ability to understand and act. (One example is the concept, tacit knowledge, which I will discuss later in the chapter. The concept seems to imply many different phenomena that are not necessarily related.) Through a process of re-framing and re-ordering our data and information new knowledge can be created. For Tsoukas (2005) knowledge is:

the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory or both (Tsoukas 2005: 123).

Bell’s definition of knowledge points towards a process of making data, information and knowledge into a system of theoretical knowledge. His main argument is that knowledge has

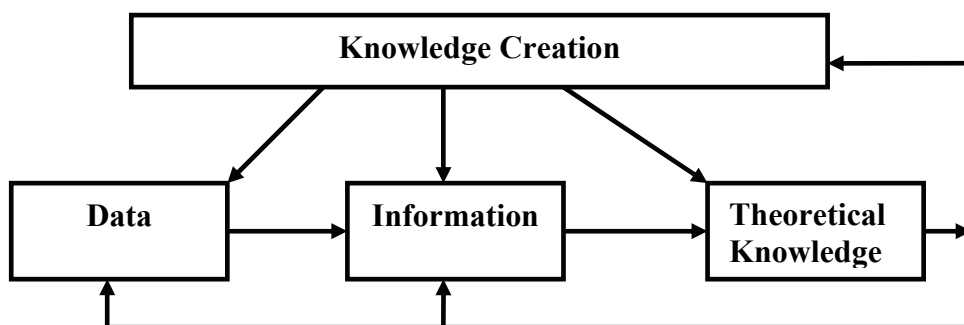
acquired a central place in late modern societies that never has existed before. He does not deny that knowledge has not been important in earlier societies. What has increased in importance is theoretical knowledge.

What has become decisive for the organization of decisions and the direction of change is the centrality of theoretical knowledge – the primacy of theory over empiricism and the codification of knowledge into abstract systems of symbols that, as in any axiomatic system, can be used to illustrate many different and varied areas of experience (Bell 1974: 20).

Bell talks about *theoretical knowledge*, defined as a set of organized statements of facts or ideas, presenting a reasoned judgement or an experimental result through some communication medium in some systematic form (Bell 1974: 115). Another concept that covers the same as theoretical knowledge is *scientific knowledge*.

The distinction both Tsoukas and Bell make is the distinction between knowledge as a creative process and a matter of judgement, and theoretical knowledge. The latter is thought and re-thought knowledge formulated as words and sentences in a codified form. The figure below is the previous figure revisited and redeveloped with judgement, intuition and feedback loops. It demonstrates that knowledge creation is a dynamic and complex process.

Figure 3: The dynamic process of knowledge creation



The figure demonstrates that data, information and theoretical knowledge are a result of a knowledge creation process. Such a process involves judgement and intuition. Some of the output from a knowledge creation process can be called data, other output can be called information and some can be called theoretical knowledge.

I will also argue that some of the output cannot be codified. A part of the outcome will remain tacit. I will return to this discussion later in the chapter under the heading tacit knowing versus tacit knowledge. There will also be a part of the knowledge creation process that will be shared orally between the participants in the process. The knowledge exists as shared experience between them.

Judgement is essential in both theory creation and use of theories. Bad judgement can result in the creation of bad theories, and bad theories can destroy good practice. For instance Ghoshal (2005) argues that bad management theories destroy good management practices. The candidates do not learn to deal with complex cases and the complexity of decision making in practice, which makes the MBA candidates not well prepared for their meeting with practice after education. According to Ghoshal (2005) there is a lack of research on the connection between management education and practice.

Our theories and ideas have done much to strengthen the management practices that we are all now so loudly condemning (Ghoshal 2005: 75).

Ghoshal (2005) argues for the old pluralism in business school based on four kinds of scholarship in university: the scholarship of discovery (research), the scholarship of practice (application), the scholarship of integration (synthesis) and the scholarship of teaching (pedagogy). During the last 30 years the only remaining scholarship is research, which has the responsibility for the situation with good theories and bad practice.

Ghoshal's (2005) argument is that the university education in business schools with their theories and the basic and taken-for-granted ideas behind the theory have a more powerful influence than anyone would admit. These ideas and theories are more influential than is commonly acknowledged by many practical men that state that they are not influenced by any theory. Many of the worst excesses of management practice have their roots in a set of ideas from management schools. Ghoshal (2005) lists scandals, such as Enron. He argues that it is the partialization of analysis, the exclusion of any role for human intentionality or choice, the use of sharp assumption, and deductive reasoning that make the theories so powerful and dangerous in practice. He argues that the theories are so abstract and theoretical that any human impact is considered non-existent. They assume that social, economic and psychological laws determine the outcome of any action performed in business, and that the individual manager has no influence over the outcome of the actions. Since moral and ethic

considerations are separated in the theories, this implies that managers can claim that their actions have only economic intentions, and that social consequences are not a part of their responsibility. The sharp theoretical assumptions make a theory elegant, but not necessarily realistic in practice and in some cases they lead to dehumanisation in practice (Ghoshal 2005).

Ghoshal's (2005) argument reminds us that knowledge in action is not objective, value free and neutral, as the scientific method tries to tell us, but has social consequences, some of which may not be socially acceptable. Knowledge in action also presupposes knowledge of ethical, social and political virtue (Eikeland 2001) in addition to a technical performance of it. It means that we, as researchers, in concrete situations must be able to do as we say, justify our actions, and discuss with others the consequences of an action before it is done.

Knowledge is a strategic resource in society and often determines definitions of what is conceived as important, as possible or not possible, and how things should be done in society. Knowledge can be used to highlight some arenas and subjects in society, while others are not object of investigation and discussion. We have to be aware that both knowledge creators and knowledge users can be quite selective in their choices of subjects of analysis and their arguments for use of theory.

The discussion so far has demonstrated that there is a difference between theoretical knowledge and knowledge creation. I will now explore the concept, knowing how, and the other knowledge concept that is connected to knowledge creation in action. My argument is that knowing how is a central concept in order to understand knowledge creation.

2.4 Knowing how

The philosopher Gilbert Ryle distinguished between knowledge and intelligence, and between knowing how and knowing that (Ryle 1949). *Knowing that* is the ability to know why a certain issue exists and what its definition is. Knowing that is theoretical knowledge in Ryle's terminology, or as Greenwood and Levin (1998) put it:

A competent expert is defined as one who verbally can argue in favour of what he or she thinks, not one who knows how to do anything in particular (Greenwood and Levin 1998: 100).

Knowing how is the ability to do something, to use intelligence in action (Ryle 1949).⁵

Knowing how emerges through the application of knowledge in a given context. Intelligence is more manifest in the way man acts than in the way man thinks (Ryle 1949). He argued in favour of knowing how in action because

theorists have been so preoccupied with the task of investigating the nature, the source and the credentials of the theories that we adopt that they have for the most part ignored the question what it is for someone to know how to perform a task (Ryle 1949: 28).

Knowing how is possible to observe and identify in action. Procedures and rules for an action cannot substitute for the knowing how to do that action. Knowing how cannot be prescribed and then executed. Knowing how is dynamic, and descriptions are static. Theoretical knowledge is thought knowing, expressed orally or in a written form; it is not knowledge in action. Knowing how can therefore not be transferred in a linear and codified form as “procedures” and “rules”, but can only be shared through actions in a context between people. Arguing for a distinct perspective or an action is not the same as doing the action or that the action can be done. The arguments can be purely theoretical, abstract and general in form, which means that they are not necessarily applicable in a given context. Knowing how is an abstract concept, but when connected to action and context it becomes concrete and specific, which implies that knowing how can be differentiated in different kinds of actions. Knowing how to build a wooden boat is different from knowing how to build a boat in steel. Knowing how to lead a project is another kind of knowing how than participating in a project as a team member. Knowing how to do a research project is different from knowing how to teach. Knowing how to write an article for an academic journal is different from writing a newspaper article. The nuances may sound small for an outsider, but they matter for those who are doing the actions. In the “knowledge society” knowledge creation has become more and more complex. The challenge is to combine different kinds of knowing how in order to create a new technological device or new medicine. To make such combinations requires people with know how, and it requires people that have developed their knowing how in real situations.

⁵ One author that has been inspired by Ryle is Polanyi (1966) with his concept, tacit knowing, which I will present later in the chapter.

Dreyfus and Dreyfus (1986) suggest a five stage model of skill acquisition from novice to expert. Their development model is summarised in the table below. The authors differentiate between novice, advanced beginner, competent doer, proficient doer, and expert. There are usually no problems in differentiating between a novice and an expert, but it can be more difficult to differentiate between the other stages in practice. One needs to have knowing how in judging the differences in kind. A novice follows analytical rules in action without paying so much attention to the context and the situation. The decision is made without any detachment from the process. As time goes by, and if the novice still is practising, her or his skill to do the action gradually improves. The person begins to understand the context, “reads” the situation and begins to feel more and more involved in the situation.

Table 2: Five stages of skill acquisition

Skill level	Components	Perspective	Decision	Commitment
Novice	Context-free	None	Analytical	Detached
Advanced beginner	Context-free and situational	None	Analytical	Detached
Competent	Context-free and situational	Chosen	Analytical	Detached understanding and deciding involved in outcome
Proficient	Context-free and situational	Experienced	Analytical	Involved understanding. Detached deciding
Expert	Context-free and situational	Experienced	Intuitive	Involved

Source: Dreyfus and Dreyfus (1986: 50).

The difference between a proficient doer and an expert is that the latter is fully involved in a situation and takes decisions fast and without too many reflections. The expert knows what to do because he or she has done the action several times and knows the outcome of the specific action.

Intuition or know-how, as we understand it, is neither wild guessing nor supernatural inspiration, but the sort of ability we all use all the time as we go about our everyday tasks? (Dreyfus and Dreyfus 1986: 29).

Ryle’s concepts have been developed by later authors. For instance, Lundvall and Johnson (1994) use the knowledge taxonomies: *know-what*, *know-why*, *know-how* and *know-who*.

Know-what is what is called information, such as the population in a region, and know-why refers to scientific principles and physical laws. The concept know-who refers to knowledge about who knows what and can do what (Lundvall and Johnson 1994). The authors argue that knowing key persons may be more important to the success in innovation than knowing basic scientific principles.

Another author that was inspired by Ryle was the philosopher Michael Polanyi who developed the concept, tacit knowing. My argument is that tacit knowing is an integrated part of knowing how, and is a part of what Dreyfus and Dreyfus (1986) called intuition. However, Polanyi (1966) was not consistent in his use of the concepts. He used both tacit knowledge and tacit knowing, which has resulted in much discussion about what he meant. Many authors argue that tacit knowledge is the opposite of explicit or theoretical knowledge. This is an understanding I do not share. I will therefore discuss the concepts tacit knowledge and tacit knowing.

2.5 Tacit knowledge versus tacit knowing

Gourlay (2004) argues that tacit knowledge is a concept with a blurred meaning:

It seems that 'tacit knowledge' is used to denote something that is personal, and collective, embodied/embedded, and disembodied, that can, and cannot be codified. Even where there is agreement that only some 'tacit knowledge' can be codified, authorities differ over the reasons for codification difficulties, and whether rules, and presuppositions, can or cannot be codified. All this confusion suggests a lack of clarity as to just what is meant by 'tacit knowledge' (Gourlay 2004: 90)

Tsoukas (2005) argues that the appropriation of tacit knowledge in management studies is a great misunderstanding. This misunderstanding according to Tsoukas (2005) is based on the analytical dichotomy between explicit and tacit knowledge. The common source for the above authors is Polanyi (1966). However, a closer examination of his text makes it clear that he was referring to a process, i.e. tacit knowing. He used the example of man's ability to recognise a face in a crowd of people. His observation was that we cannot tell why we can recognise a face, but still we can do it. He draws the conclusion that:

we can know more than we can tell (Polanyi 1966: 7).

Polanyi's (1966) argument is that there is knowledge that we as individuals know, but which is hard to express in words. This implies that some part of an action is tacit. Polanyi (1966) was very explicit that he preferred the concept tacit knowing, rather than tacit knowledge.

I shall always speak of 'knowing', therefore, to cover both practical and theoretical knowledge. We can, accordingly, interpret the use of tools, of probes, and of pointers as further instances of the art of knowing, and may add to our list also the denotative use of language, as a kind of verbal pointing (Polanyi 1966: 7).

Nonaka and Takeuchi (1995) quote Polanyi, but use the concept, tacit knowledge, not tacit knowing. By doing this they change a process to a stock. Tacit knowing becomes tacit knowledge, which in the authors' understanding is knowledge waiting to be discovered. Nonaka and Takeuchi's (1995) tacit knowledge is knowledge that is waiting to be translated to explicit knowledge (Tsoukas 2005). Tsoukas (2005) argues that this misunderstanding reduces tacit knowledge to what can be articulated. Tacit knowledge and explicit knowledge are not two typologies, but are two sides of the same coin. The difference between Nonaka and Takeuchi (1995) and Tsoukas (2005) is that the former authors argue that tacit knowledge is a substance that is possible to make explicit through a conversion process. The latter authors argue that tacit knowing is a process that can be observed, but not captured and made explicit with words.

Polanyi (1966) is very explicit that even tacit knowing is hard to express with words, both orally and in the form of an extended text; it can be observed and identified in action. This implies that tacit knowing is not possible to identify by interviewing people, but only through observation. According to Polanyi (1966) it is not possible to distinguish knowing from the action in itself, i.e. to separate knowing from the subject. They are a totality in the action, such as when a doctor is diagnosing. Neither could exist without the other. The doctor could not practice as a doctor without his theoretical knowledge, but he may not be able to work without his tacit knowing, trained through many years. Tacit knowing produces an effect in the knower, which can be identified in action. When executed, tacit knowing can create an observable result, such as recognising a face, but the effect in the knower is different from the observable result. Tacit knowing results in the perception of 'phenomenal qualities of external objects' and 'mental qualities' of 'feeling, action and thought' (Gourlay 2004). Polanyi contends that involvement and commitment construct tacit knowing. This process he calls indwelling:

it is not by looking at things, but by dwelling in them, that we understand their joint meaning (Polanyi 1966: 18).

Indwelling breaks the traditional dichotomies between mind and body, reason and emotion, subject and object, and knower and known. Indwelling makes tacit knowing subjective, personal and connected to our feelings (Tsoukas 2005). The expert cannot necessarily explain how he performs an action in detail, and why he chose a specific action in a given context, but still the action is appropriate regarding its consequences and effects. It is based on a personal insight that is essentially inarticulate (Tsoukas 2005). A personal process is not possible to codify, but the action a skilled actor does is possible to observe, and the action can be discussed with the actor.

Tsoukas (2005) uses an example from Nonaka and Takeuchi (1995) when they describe the process of externalising tacit knowledge.⁶ The case Nonaka and Takeuchi (1995) describe is a process of sharing a master baker's tacit knowledge of kneading with a software developer Ikuko Tanaka. She learned her kneading skills through observation, imitation and practice with her master. This "knowledge" she tried to share with engineers who had the job of constructing a bread-baking machine. The process was successful and resulted in a bread-making machine. However, the kind of knowledge that Nonaka and Takeuchi (1995) describe in their book is rule based knowledge, such as in propositional 'if, then' statements, not tacit knowing.

After a year of trial and error and working closely with other engineers, the team came up with product specifications that successfully reproduced the head baker's stretching technique and the quality of the bread Tanaka had learned to make at the hotel. The team then materialised this concept, putting it together in a manual, and embodied it in the product (Tsoukas 2005: 153).

The kind of knowledge that Nonaka and Takeuchi (1995) codified was technical knowledge, not the personal knowledge in kneading bread Tsoukas (2005) argues. Tsoukas' (2005) argument is that personal knowledge is not possible to use to make rules. The process between Tanaka and the master baker, where she learned to knead bread, was a social process between them, like the one between a master and his apprentice (Tsoukas 2005). In the process with the engineers Tanaka was able to formulate some words about the process. She was reflecting together with the engineers what she had been doing, and the actions were

⁶ The process is described in Nonaka and Takeuchi (1995) on pages 103-6 and in Tsoukas (2005) on pages 152-3.

given terms, such as the stretching technique, which was called “twisting stretch”. However, the process of reflecting was different from the process of making bread. She was making a judgement about the process together with the engineers; she was not doing the process. A process is not possible to separate into distinct parts that can be examined independently. If this is done the meaning will be lost (Tsoukas 2005). What can be done is to reflect on actions we observe and try to name and re-name the phenomena. As Tsoukas (2005) argues:

New knowledge comes about not when the tacit becomes explicit, but when our practice is punctured in new ways through social interaction (Tsoukas 2005: 158-159).

If we follow Tsoukas’ (2005) argument, which seems to be in line with Polanyi’s understanding of tacit knowing, tacit knowing is an integrated part of every action. This implies that we cannot describe explicitly and accurately every part of an action, but still we can do an action. It is simply not possible to put words to every aspect of an action. This makes tacit knowing an integrated part of knowing how.

2.6 Discussion and summary

The previous discussion has been along two dimensions. One dimension was about the codified or explicit output from knowledge creation processes, such as data, information and theoretical knowledge. The synonym for the latter concept is scientific knowledge. In the knowledge discourse it is knowledge in codified form that has received much attention. The reason is that in codified form knowledge can be shared fast and easily by the use of the internet. This has made knowledge in these forms ubiquitous. When knowledge has become codified it is a small step to commoditization of knowledge. Knowledge can be bought and sold on a market, if the price is right. However, knowledge is more than codified knowledge. Some knowledge exists as orally shared reflections and experience between the creators of knowledge. An outcome of a knowledge creation process can also be changes in an organization, changes in work methods etc. These changes can have, and often do have, connections to codified knowledge or ideas that are founded in codified knowledge, but change processes require more than theoretical knowledge; they require knowing how. This leads to the second dimension of knowledge.

Knowledge creation is a process where intuition, judgement, ethical, social and political virtue and knowing how to do specific actions are involved. Tacit knowing, which is

integrated in knowing how, makes this form of knowledge hard to codify. It can only be acquired in action and developed through repeated actions. Knowing how takes time to acquire and even longer time to develop to expert level. If the proficient and expert knowing how fits specific needs in the market this kind of knowledge can be highly rewarded in the “knowledge economy”. The kind of knowledge that is considered as knowledge in the post-capitalist society is not talk in a general meaning of the word, but action (Drucker 1993).

The knowledge we now consider knowledge proves itself in action. What we now mean by knowledge is information effective in action, information focused on results. These results are seen outside the person – in society and the economy, or in the advancement of knowledge itself. To accomplish anything, this knowledge has to be highly specialised (Drucker 1993: 46).

Drucker (1993) connects knowledge to economic purposes, and that knowledge must be useful in a practical sense. Today’s challenge is to decide *what to do and how to do it* (Drucker 1993). The “knowledge economy” and the “knowledge society” increase the value of persons, teams, organizations, etc. with the right kind of knowing how.

The two dimension of knowledge are not reducible to each other. They are of different kinds. The ambiguity in the knowledge concept is a substantial ambiguity. Knowing how is knowledge about how to do specific actions in specific contexts and situations. Actions are not context free as codified knowledge is; they are context dependent. Codified knowledge is output from a knowledge creation process, but the output is different from the process because words and sentences can never catch the complexity and the richness in details and nuances from a knowledge creation process. Words become poor compared to the richness of a process. An attempt to try to write from a knowledge creation would produce something impossible to read because of all the digressions during the process. Theoretical knowledge, such as a dissertation, will by necessity be a linear presentation of a dynamic and complex knowledge creation process.

When Polanyi's (1966) tacit knowing was translated to Norwegian the concept was translated as *taus kunnskap*, which changed the content of the concept. Since I am a Norwegian writing in English I see a need to use some translations of some of the concepts I am using. The Norwegian language does not have the same distinction between knowledge and knowing as the English language has. Knowing how is harder to translate. One solution could be to use knowing how, but a shorter and often used word in Norwegian is *know how*. I have therefore

decided to use the concept *know how* in Norwegian. The translation of tacit knowing is *taus know how*. Knowledge creation I will translate as *kunnskapelse*.

In the previous discussion I have indicated my position and my understanding of knowledge creation and the knowledge concepts theoretical knowledge, knowing how and tacit knowing. In the next chapter I will discuss a theory that argues that a new mode of knowledge creation has developed in society. Authors argue that a new mode of knowledge creation is challenging the old mode of knowledge creation, and the old Humboldtian legitimacy of university (Gibbons *et al.* 1994; Nowotny *et al.* 2001). The challenge of university is the topic for the next chapter.

3. University challenged

In this chapter I will discuss how the knowledge concept is used in the current challenge university faces.

The chapter has the following structure: I will start by defining the legitimacy concept of university and then connect the concept to the old discourse about university. The old discourse comprises the Humboldtian ideals for knowledge creation in university. Then I will present the Mode-2 concept and the *agora* concept. The Mode-2 concept is used to challenge the old mode of knowledge creation and the Humboldtian legitimacy of university. After that I will discuss the consequences of the challenge university is being faced with. I will end the chapter by arguing that even if the Mode-2 concept is interesting and challenging, it is black boxing the knowledge creation process in agora.

3.1 *The Humboldtian legitimacy of university*

Institutions are relatively durable social structures that shape and constrain the behaviour of actors operating within a given social system (Scott (1995)). In institutional theory, the environment is seen as a culture that provides a more or less shared view of how an institution or an organization should look and behave (Scott 1995; Hatch and Cunliffe 2006). The environment constitutes the legitimacy for an institution (Scott 1995).

Legitimacy is a condition reflecting cultural alignment, normative support, or consonance with relevant rules or laws (Scott 1995: 45).

Different approaches such as the regulative and normative within institutional theory emphasize legitimacy differently (Scott 1995). The *regulative* approach emphasizes that institutions constrain and regularize behaviour, for example with rule-setting, monitoring and sanctioning activities (Scott 1995). Regulations can be highly formal and assigned to specific actors, such as the court or informal. The regulative approach assumes that actors have a “natural” interest that they pursue rationally (Scott 1995: 37).

The *normative* approach rests on a normative pillar where the emphasis is on normative rules that specify a prescriptive, evaluative and obligatory dimension of social life (Scott 1995: 37). Normative rules specify aims, allocate roles to actors, and specify how things should be done;

i.e. they regulate behaviour. The rules both enable and constrain behaviour. The difference between the regulative and the normative approach is that the latter asks:

Given my role in this situation, what is expected of me? (Scott 1995: 39)

while an actor within the regulative approach asks:

What are my interests in this situation? (Scott 1995: 39)

If an institution or an organization does not follow the rules its legitimacy is reduced, and in special cases the organisation can be driven out of business (Hatch and Cunliffe 2006).⁷

For a long period of time knowledge creation of data, information and theoretical knowledge has been organized and located in an institution called university. University is one of the older institutions in society. The first university in the western world is said to have been the University of Bologna, which was founded in 1008 AD. The idea of university as a place for knowledge creation is a result of a historical development. According to Delanty (2001), in the early period, in classical modernity, university was not central to the creation of knowledge. In the Renaissance university played a part in shaping the *New Learning*, but was less important in the Enlightenment where the mode of knowledge was mainly formed outside academia by men of letters, free-floating intellectuals and often members of the aristocratic orders (Delanty 2001: 22). The mode of knowledge that emerged was revolutionary and emancipatory. This period marked a change to the subject of truth and accessibility of knowledge for society in general (Delanty 2001).

From the end of the eighteenth century, university became more important in society as a producer of codified knowledge and educating students for the state. The four ideals in the table below constitute the Humboldtian legitimacy for university and the modern university in the early nineteenth century. The Humboldtian legitimacy refers to Wilhelm von Humboldt (1809-1910), and his ideas about university

⁷ The authors give Anderson and Enron in the US and Parmalat in Italy as examples of organizations that lost their legitimacy because of unethical actions and went out of business.

Table 3: Educational ideals typified as Humboldtian

Ideals	University founded upon
Academic Freedom:	Independent 'critical' judgement
The unity of knowledge:	Reason in the 'depths' of scholarship
Bildung:	Neo-humanist idea of individuality
Principles of academic research (method) and practices of learning:	Search for the 'universal form' (Ideen) through receptivity and creativity

Source: Brandser (2006: 31).

Academic freedom is said to be based on a liberal idea from the Enlightenment. It is synonymous with liberation from dogma, superstition and ignorance (Brandser 2006). It is guided by Kant's ideas of pure reason detached from politics and religion (Delanty 2001; Brandser 2006; Slagstad 2006). Academic freedom is an ideal attributed to each individual scholar, and to the community of scholars vis-à-vis the state (Brandser 2006).

A part of the discourse about academic freedom and the unity of knowledge can be traced back to Immanuel Kant, and his writings in an essay from 1798, *The Conflict of the Faculties*. Kant advocated the critical power of reason as the justification of university (Delanty 2001; Brandser 2006).

The magistrates, doctors and ecclesiastics are in the service of the state and utility, and not, like the philosophers, in the service of knowledge and truth. They are mere 'businessmen' and since the university has no power of its own, the state should keep these businessmen of knowledge in order. The philosophy faculty 'must be conceived free and subject only to laws given by reason, not by government' (Kant, 1799: 43 in (Delanty 2001: 32).

The conflict between faculties was a conflict between the faculties that served needs in society and the faculty of philosophy, which served nothing else than reason and truth and therefore was independent of social forces, which wanted knowledge to be used for utility purposes. At that time there was a conflict between modernism and despotism and between enlightenment and ignorance. Kant's defence of the university as a place for academic freedom set the standard for the argument about knowledge as an end in itself (Delanty 2001).

Bildung in the Humboldtian ideal is that a person educated to be a free and harmonious individual will be a better citizen than a person educated merely to be citizen (Brandser 2006). Humboldt argued that individual freedom in education was the best means to ensure the state had a well educated work force. Only a person that is freely and harmoniously *gebildet* will

become a “wise legislator” able to serve the needs of the state and society (Brandser 2006). The only way to keep university free from utilitarian demands was to argue for the autonomy of university and that *Bildung* would guarantee the best educated students.

Humboldt’s method for educating students was to help each student to realize his or her potential, to form their character and to engage the student in critically examining facts and what it was that gave the facts meaning. The Humboldtian university model was based on the integration of research and teaching after they had been separated for a long period (Delanty 2001). It was *Bildung* that was considered as giving knowledge. The purpose was to make the student effective by enabling him to know what to say and how to say it.

The Humboldtian model reduced the influence of and control by the state to a minimum. In return for educated candidates the state guaranteed university independence from political and clerical authority (Slagstad 2000; Delanty 2001).

Another influential thinker was Cardinal Newman (1801-1890). Newman was occupied mainly with education, but not by integrating research and education like Humboldt (Delanty 2001). Newman constructed the defence for liberal education and the liberal individual: the gentleman (Readings 1996). As Newman expresses it:

It is common to speak of “liberal knowledge,” or the “*liberal* arts and studies,” and of a “*liberal* education,” as the especial characteristic or property of a University and a gentleman (quoted from Readings 1996: 74, italics in the manuscript).

Newman was, like Humboldt, preoccupied with the education of the whole person, a habit of mind formed which lasts through life, with attributes such as freedom, equitableness, calmness, moderation, and wisdom; philosophical habit. The object of university is to educate students with “intellectual culture”, not with particular knowledge (Readings 1996). Newman constructed liberal knowledge as an opposite to practical knowledge and the principle of usefulness of knowledge. He argued for knowledge as an end in itself.

The Humboldtian legitimacy was not much questioned in the nineteenth century, but during the century a more utilitarian view of knowledge was emerging. This view argued that knowledge was not an end in itself, but a means to an end, the end of happiness, social prosperity or peace. In the twentieth century the university’s role has changed into institutions

of mass education to serve needs in society. During this period it is not education of the whole person in the Humboldtian ideal of *Bildung*, but *Ausbildung*, or vocational training, that has been the main objective (Delanty 2001; Slagstad 2006).

At the current time the relationship between knowledge and university is once again becoming looser. The idea that university rests on a founding idea of reason, truth and universality of knowledge through teaching and research is fragmented (Delanty 2001). The legitimacy of university is challenged and seems to be undergoing change (Readings 1996; Slagstad 2000; Delanty 2001; Nowotny *et al.* 2001).

University is challenged by the market economy. Etzkowitz and Leydesdorff (1997) argue that the former dual relationship between the state and university and between university and the market is replaced with a triple helix between university, state and market. Many universities have become economic actors and are meeting certain expectations of behaviour and contributions to the future economic development of society. For instance, the European Commission argues that Europe's universities need to be modernised if they are to contribute effectively to the "knowledge society" and innovation (European-Commission 2006).

Links between universities and industry need to be developed enormously if our economy is to benefit from the knowledge generated in institutions (European-Commission 2006: 21).

There are different theories that discuss the current challenge for university along the same kind of arguments as the European Commission; i.e. that university must change in order to fulfil new challenges in society.

One such change process is the *Bologna Process* that affects many European universities.⁸ This reform process has direct implications for the changes in the European system of higher education, including the Norwegian system. The purpose of the Bologna process is to develop a common higher educational area in Europe by harmonising academic degree and quality assurance standards. A common system in Europe will facilitate the mobility of knowledge workers in Europe. The Bologna process has ten target areas that include: the adoption of a system of easily readable and comparable degrees, the adoption of a system essentially based

⁸ The *Bologna Process* refers to the declaration signed in Bologna on 19th of June 1999 by the Ministers of Education in 29 European countries. The *Bologna Process* is named after the university where it was proposed, the University of Bologna in Italy.

on two cycles: Bachelor's and Master's; the establishment of a system of credits, the promotion of mobility and the promotion of European co-operation in quality assurance. The focus in the *Bologna Process* has been on reforming university as an organization. So far the reform process has paid less attention to the relationship between university and the market and university as a means of economic development in its host regions.

One of the more discussed contributions to the current debate about university is Gibbons *et al.* (1994) book *The New Production of Knowledge*, and their follow-up book *Re-thinking Science* (Nowotny *et al.* 2001). The authors discuss changes in the creation of knowledge in society and the consequences for university. They argue that the changes affect research and higher education and all disciplines in university: science and technology as well as social science and the humanities.

3.2 The Mode-2 argument – University as an academic capitalist

The main argument from Gibbons *et al.* (1994) is that in Mode-2 knowledge is produced in a context of application. This implies that the process of knowledge creation and use of knowledge has been integrated. The authors argue that knowledge is created through intense dialogue between different constructors and the user of knowledge. The context of application describes the total environment in which scientific problems arise, methodologies are developed, outcomes are disseminated and uses are defined (Gibbons *et al.* 1994). The knowledge constructed is “transdisciplinary”, “transinstitutional” and “transnational”. In Mode-2 scientific, technological and industrial creations become closely connected (Gibbons *et al.* 1994).

The driving force behind the development of Mode-2 knowledge construction lies in the intensification of international competition in business and industry (Gibbons *et al.* 1994). The authors argue that the competition is not a price competition, but a competition of creating new innovations faster and faster. Many of the new actors on the market are challenging the old, established companies by introducing new innovations. To stay in business the speed of innovation has to be accelerated for every single firm. On the macro level this is seen as a continuous stream of innovation. The new innovations have to be different from the previous innovations invented by a competitor and rival. The in-house resources in the single company are no longer satisfying, and specialist knowledge from a

wider range has to be integrated into the process of constructing innovations. Mode-2 knowledge is faster, more efficient and more specific for a useful economic purpose, than Mode-1 knowledge (Gibbons *et al.* 1994).

Mode-1 is the traditional mode of creating knowledge, such as in a university. In Mode-1 knowledge is constructed in a disciplinary or homogeneous environment by disciplinary researchers. This process makes the knowledge more general. It can suit more than one purpose. When the knowledge construction process is finished it is transferred to the users. The user has to apply the knowledge to his context before the knowledge can be used. In Mode-1, knowledge is constructed in specific disciplinary environments where pure science generated in theoretical-/experimental environments is applied, or technology is transferred, and knowledge is managed (Gibbons *et al.* 1994). Mode-1 knowledge is then transferred to society. Both modes of knowledge creation exist side by side in society (Gibbons *et al.* 1994).

The validity criteria are different for the two modes of knowledge. Mode-1 knowledge is checked against peer reviews done by other researchers. The researcher judged as qualified to do a peer review is carefully selected by such criteria as previous contributions to the discipline. The reviewers work to maintain the discipline and channel individuals to work with topics that are judged to be central to the advancement of the discipline (Gibbons *et al.* 1994). In Mode-2 the quality criteria are expanded to include political, economic and social criteria. Questions that guide the review include:

Will the solution, if found, be competitive in the market? Will it be cost effective? Will it be socially acceptable? (Gibbons *et al.* 1994: 8).

The authors argue that since the quality control is more broadly based, it can result in lower quality of the knowledge constructed, but not necessarily. The quality check in Mode-2 is of a more composite, multidisciplinary kind. However, they do not elaborate the criteria further, which leaves the impression of an unsolved question. In their new book, *Re-thinking Science*, (Nowotny *et al.* 2001) they continue the argumentation. The authors connect the Mode-2 validity check with an argument of socially robust knowledge created in agora. It is society through participation in agora that decides if the knowledge is socially acceptable. The authors talk about a process of participation and negotiation between the actors regarding what is defined as socially acceptable knowledge in the agora. This implies that the researchers' monopoly of defining what counts as knowledge is broken. The peer review is

still a requirement for what counts as scientific knowledge, but in addition it has also to go through a social review process in the agora in order to become *socially robust knowledge*.⁹

The traditional Mode-1 university risks the fate of being outstripped by Mode-2 knowledge production. There will not be a market that will pay for general knowledge that needs to be transferred and then adapted to a context. Nowotny *et al.* (2001) argue that university needs to open up and change in line with the requirement of Mode-2 knowledge production. New kinds of university are already established, such as private corporate universities, virtual universities, for-profit university and public entrepreneurial universities that compete with the traditional university (Nowotny *et al.* 2001). These kinds of universities challenge the Mode-1 university. A Mode-2 university is a university that is selling its knowledge; i.e. it is acting like a capitalist, an academic capitalist. The Mode-2 argument splits education and research. Research is seen as a Mode-2 activity and education as a Mode-1 activity, which implies that education can remain in university. The authors argue that there is only a need for university in order to certify higher education. This is a role where university still can retain a monopoly situation (Nowotny *et al.* 2001). In the table below I have summed up some of the differences between Mode-1 and Mode-2 knowledge.

Table 4: Comparison of Mode-1 and Mode-2

Mode-1	Mode-2
Knowledge is created within the context of an academic community	Knowledge is created in a context of application
Knowledge is created in a disciplinary mode; e.g. in a university department	Knowledge is created in a transdisciplinary mode
Homogeneous knowledge is required	Heterogeneity knowledge is used
Hierarchical organisation of the knowledge production	Heterarchical, flexible and transient organization
Quality control through peer review	Quality control done by the participants in the knowledge creation process through social accountability

Source: Gibbons *et al.* (1994)

⁹ The Agora was the heart of ancient Athens, the focus of political, commercial, administrative and social activity, the religious and cultural centre, and the seat of justice.

Mode-1 knowledge is primarily accumulated through professionalization of disciplinary knowledge, for example, a university department, while Mode-2 is the opposite. The authors argue that the two modes are created as each other's opposite.

3.3 A new legitimacy for university?

The Mode-2 concept has resulted in an international debate about the future role of university. There seems to be an agreement that the authors have identified a significant change process for universities (Slaughter and Leslie 1997; Chatterton and Goddard 2000; Delanty 2001; Brulin 2004; Brandser 2006; Slagstad 2006).

An empirical question is how widespread the change process is in the "world of universities". There is a big difference between the thousands of universities around the world, such as between the Ivy League universities and state universities in the US, or Oxford and Cambridge versus other universities in the UK.¹⁰ Studies from the US indicate that the process has come far, especially in the elite universities (Readings 1996; Slaughter and Rhoades 2004).

Readings (1996) argues that the content of reason and culture is replaced by a technobureaucratic notion of search for excellence shaped by corporate capitalism. The search for excellence is the effort of winning rankings between universities, which is based on a set of indicators, such as incoming grades, the grade point average during study, the number of staff with PhDs and the financial health of the university etc. The indicators are self-referential, and what excellence means no one knows, except that everyone has his or her idea of what it might be. The appeal for excellence marks the fact that there is no longer any idea of university, or rather that the idea has lost all content (Readings 1996: 39).

The temperature in the discourse increases when it comes to the interpretation of the change process. Slagstad (2006) argues that there is a distinction between describing a tendency, as the authors behind the Mode-2 concept do, and drawing a conclusion about whether what is happening should happen. The Mode-2 authors mix together a description of academic

¹⁰ The Ivy League is eight private institutions of higher education located in North-eastern US. The universities are: Princeton, Yale, Harvard, Dartmouth, Brown, Cornell, Columbia, and the University of Pennsylvania.

capitalism with a normative argument (Slagstad 2006). From the objective fact that university is changing they reach the conclusion that university should change and that it should change in accordance with the facts they describe.

Brandser (2006) demonstrates that the Mode-2 concept has resulted in a new way of talking about university and knowledge. It is a new discourse where the Mode-2 concept is used to challenge the old discourse about university and knowledge creation. The old way of talking about university is represented with Mode-1, and the new and modern way of talking about university is represented with Mode-2. Brandser argues that the concepts, such as homogeneous knowledge versus heterogeneity knowledge or hierarchical organization versus heterarchical, flexible and transient organization, are used to demonstrate that the Mode-1 university is old fashioned, rigid, with narrow research, disciplinary gatekeepers and a social system for the reproduction of elites (Brandser 2006). On the other hand, the new university; i.e. the Mode-2 university is open, flexible, socially accountable, de-institutionalized, and an egalitarian institution that can function in a globalized world. Brandser (2006) calls this a transformation of universities into service institutions where the main aims are to secure economic progress and increased opportunities for all; i.e. to be useful. The argument is so pervasive that the change process is seen as necessary and inevitable. The use of words such as “competition” and “strategic planning” is a clue to the fact that university can be treated as analogous to any other business corporation (Brandser 2006).

This change indicates that a new set of norms now determines which questions are relevant and important, and which questions are not (*Brandser 2006: 232*).

The legitimacy of university seems to be in transition from a Humboldtian legitimacy towards service as the new legitimacy for society; i.e. to be useful for needs in society. Brandser (2006) ends her analysis with a conclusion that the new discourse about a necessary reform process of university has contributed to the exclusion of any other alternatives to the discussion of university.

My criticism of the Mode-2 concept is that the concept is black boxing the knowledge creation process. This is the next topic of discussion.

3.4 The agora

I have discussed the Humboldtian legitimacy of university and demonstrated that it is challenged by a new norm for university. The market has changed the previous dual relationship between university and the state. The new legitimacy is connected to the needs in the economy, and the norm is that university should serve needs in society and be useful for actors in society.

I think Gibbons *et al.* (1994) have identified a real change process in the creation of scientific knowledge. Mode-2 is a different kind of knowledge in action; i.e. it is different kinds of knowing how that are collaborating for specific purposes. The creation of new, complex and advanced knowledge, such as in medicine or biotechnology, requires the participation of different kinds of knowing how in its moment of creation. This requires scientists with different kinds of knowing how that are willing to participate with each other and with other actors, (consultancy, business people, engineers) with other kinds of knowing how. Mode-2 is therefore a shift from individual knowledge creation; i.e. Mode-1, to a collective creation process of knowledge where different kinds of knowing are involved.

There is one role, which is less discussed in the Mode-2 approach and that is how to ensure that university knowledge is kept as a public good. The public-good knowledge regime is based on valuing knowledge as a public good to which the citizenry had claims, such as universality, the flow of knowledge, organised scepticism and academic freedom (Slaughter and Rhoades 2004). In academic capitalism this separation has to a great extent disappeared and even reversed Slaughter and Rhoades (2004). In this regime the claims from the private sector come before the claims from the public sector because of the expectations of growth from the “knowledge economy”.

Knowledge is constructed as a private good, valued for creating streams of high-technology products that generate profit as they flow through the global markets (Slaughter and Rhoades 2004: 29).

I also acknowledge that university is challenged by a new mode of creating knowledge. However, even if a university is willing to accept the challenge from a new mode of knowledge creation, they do not necessarily have the right kind of knowing how to participate and create knowledge with actors in society (Levin 2007). The author’s argument is that universities need to develop knowing how in participating with actors in society.

It may sound strange that university, the institution for learning and knowledge creation has to learn how to create knowledge with others. Greenwood and Levin (2001) argue that universities are not learning organisations. They are bureaucratic organizations aimed at educating students and doing research, and not at interacting, learning and creating knowledge together with other actors.

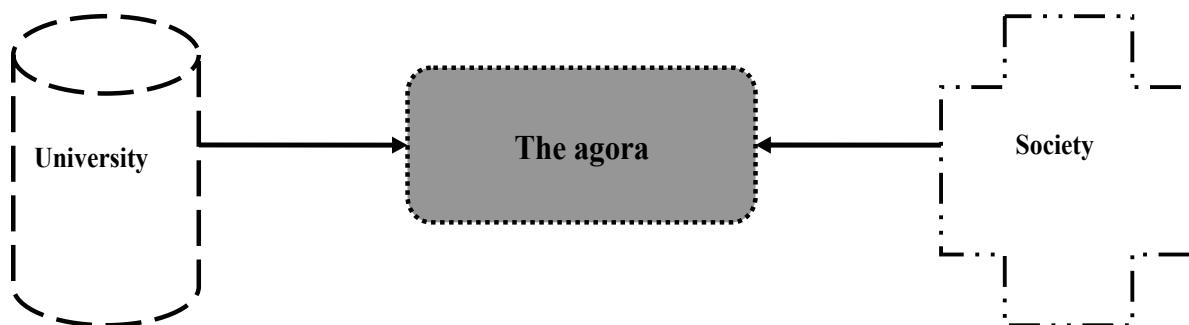
The argument from Levin (2007) points to the fact that it is not necessarily so that interactive learning and knowledge creation happens even if actors from university and the region meet each other. Gibbons *et al.* (1994) just state that knowledge is created in a context of application. One problem with the Mode-2 concept is that it does not specify how knowledge creation processes between university and actors in society actually happen in the agora. The authors define socially robust knowledge as knowledge that is negotiated between participants as a social review process in the agora, but they do not specify how the knowledge creation process happens and how socially robust knowledge is created in the agora. As a process concept the Mode-2 concept lacks, for example, a discussion of *how Mode-2 knowledge is created as socially robust knowledge in the agora*. The authors argue that university is challenged by Mode-2, but they do not discuss how the challenge is framed and discussed between actors from university and society. The concept is blurred when it comes to:

- a discussion and a specification of rules or procedures for the knowledge creation process, such as how the process is organized,
- a discussion of who is interacting with whom, and how often they are meeting each other,
- a description of how tensions and disagreements are handled between actors in the agora,
- a discussion of what kind of knowing how is involved in the process.

The authors black box the new mode of knowledge creation between university and society; cf. the figure below. The slashed lines in the figure around university, agora, and society illustrate that the borders between them are transgressive. Even if knowledge creation between university and society is complex, the current challenge for university is too serious to be black boxed. There is a need to open up the black boxes between university and actors in society. This implies that the agora; i.e. the space between university and society is black

boxed. I will return to the above elements in chapter five, where I present different action research models.

Figure 4: The agora -The black box of knowledge creation between university and society



The agora is the public space in which ‘science meets the public’ and in which the public ‘speaks back to science’. It is the domain (in fact, many domains) in which contextualisation occurs and in which socially robust knowledge is continually subjected to testing while in the process it is becoming more robust. Neither state nor market, neither exclusively private nor exclusively public, the agora is the space in which societal and scientific problems are framed and defined, and where what will be accepted as a ‘solution’ is being negotiated (Nowotny *et al.* 2001: 247).

I will use the ancient Greek concept of *agora* to denote the meeting between university and society and more explicitly between a regional university and regional actors. I will use the concept *agora*, in a singular form. The agora is an abstract concept that denotes concrete knowledge creation processes between university and regional actors. The *agora* is the public space where “science meets the public” (Nowotny *et al.* 2001).

One weakness with these contributions to the discussion about university is that they lack an explicit spatial perspective in addition to the agora concept. Space matters, as Massey, Wield *et al.* (1992) argue. Knowledge creation happens in space, in regions and in places in society.

In the next chapter regional development theories and the role of university in them will be more closely examined.

4. The regional role of university

My aims with this chapter are to present central theories about regional development. I will start with a discussion of why regions are interesting in a globalized world, and I will define concept such as region and regional actor. Then I will present the regional cluster theory, Triple Helix and the Regional Innovation Systems approach. I will present the theories and see how they discuss the role of university and knowledge creation processes in the agora. I will round off the chapter with a discussion of the regional role of university. The regional role of university is a new one for university. It is different from the passive effect of a university in a region. A university has a regional effect by just being located in a region. The regional role demands more of universities than just research and education of students. The regional role is one of collaboration between university and regional actors.

4.1 Why regions?

During the last 10 years the interest in the region as a phenomenon for economic activity has grown despite increased globalization, or maybe, as a result of increased globalization. The regional cluster theory has, so to speak, contributed to “placing the region on the map”. In a period of time with increased globalization, where distance and proximity seem to play a smaller role, where continuous re-localisation of economic and social activity is more the rule than the exception, where capital seems to be spaceless and borderless and is continuously on the move, why are regions and individual places interesting to study? The globalization argument is that regions and places are becoming less relevant as objects of economic activity, and as objects of study for social science (Isaksen 2001). The counter argument is that globalization is increasing the importance of localisation, and that regional economies rather than national economies are the places for the creation of knowledge, economic wealth and trade in a globalized world (Porter 1998; Fujita, Krugman, and Venables 2000; Isaksen 2001). Porter (1998) formulates it in this way:

In a global economy – which boasts rapid transportation, high speed communications and accessible markets – one would expect location to diminish in importance. But the opposite is true. The enduring competitive advantages in a global economy are often heavily localised, arising from concentrations of highly specialised skills and knowledge, institutions, rivalry, related businesses, and sophisticated customers (Porter 1998: 90).

The interest in the region is founded in the argument that the regional dimension seems to be of key importance in knowledge creation processes, even in a globalized world (Tödling and Trippel 2005). Over 100 regional innovation studies have been documented worldwide (Cooke 2004). Regionalization can be seen as an important aspect of a globalization process (Isaksen 2001). Regionalization is a process that refers to economic activities dependent on resources that are specific to individual places and regions (Storper 1997). The interest in the region as an object of study is also a clue to the fact that regions are different, and the challenge is to explain why regions are different. Some regions enjoy economic success, while other regions face the challenge of regional restructuring of industry.

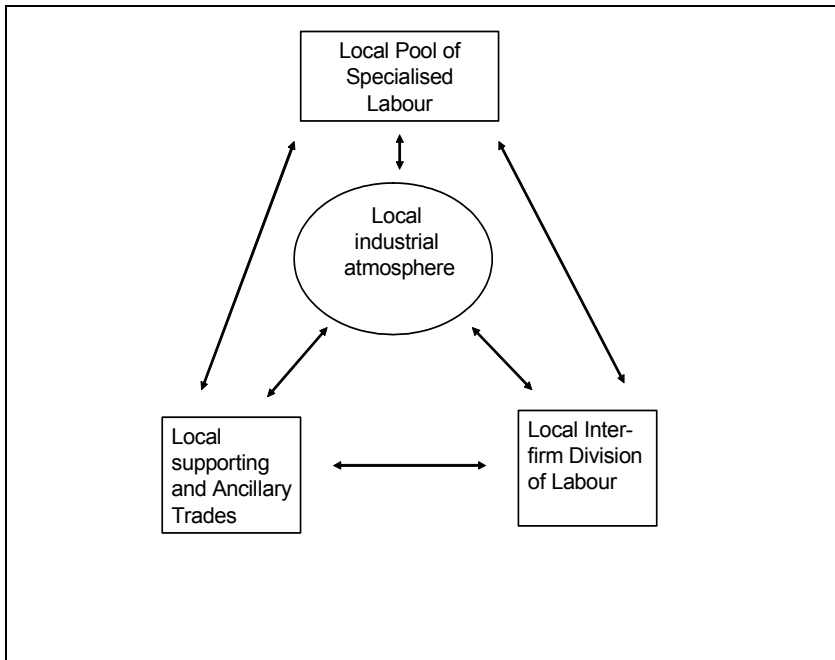
The interest in the region as an object of study goes back to Alfred Marshall (1890), and his discussion of localisation and concentration of specialised industries in specific places, which he named industrial districts (Asheim 2000). Economic geographers have focused on the region as an object of study for a long period, but it is the business economist Michael Porter, more than any economic geographer, that has made the region concept known among policy makers with his regional cluster concept (Martin and Sunley 2003). Porter's cluster concept is therefore of interest to elaborate, together with "less well known" theories such as Marshall's industrial district, Triple Helix and Regional Innovation Systems (RIS). The common factor for these theories is the region as an object of study, but the latter theories discuss the role of knowledge and university more explicitly than the former.

The region concept needs some elaboration. A region can be defined as an administrative area (Asheim 2006), such as Aust-Agder County and Vest-Agder County, which are defined as the Agder region. A regional actor is an actor who is located in a specific region. The concept does not say any more about the actors in a region, such as industry, the public sector, civil society and the relationships between them. Each of the actors is different. Industry comprises big companies, small companies, old companies, new companies, companies in knowledge intensive business and companies with less dependence on a well educated work force. Business also comprises companies that produce industrial products, more abstract knowledge or companies that supply other companies with input to their production. The concept of region therefore reveals a huge diversity, the moment one takes the lid off it. When I use the concept *region* I am referring to a specific area, such as the Agder region. A *regional actor* is an actor that is located in a region. When necessary, I will distinguish between the different characteristics of regional actors.

4.2 The Regional Cluster Model

The clustering of specialised economic activity in “industrial districts”, as Alfred Marshall called it, is an integral feature of industrial organization (Marshall 1890). He argued that there are factors that characterised the “local atmosphere” in industrial districts.

Figure 5: Marshall’s triad of the external economics of industrial location



Source: Martin and Sunley (2003: 8).

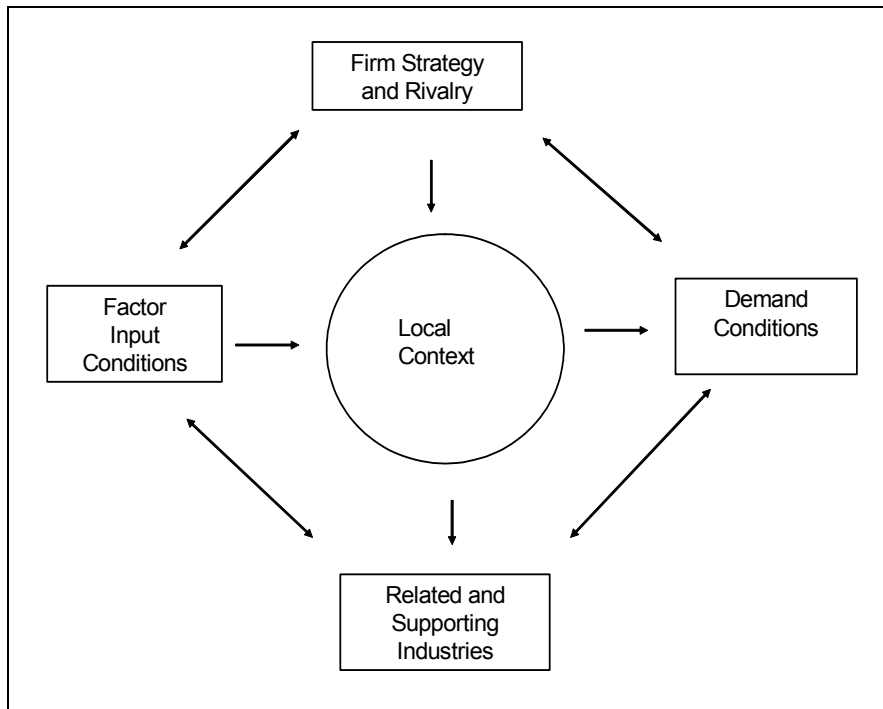
The first factor was the ready availability of local skilled labour and a local labour market. The second factor was the growth of supporting and ancillary trades, supply of inputs to the industry and organization of trade. The third factor was the specialisation of different firms in different stages and branches of production, and the use of specialised machinery, cf. the figure on the next page. The start of an industrial district he explained as a mystery in the air, but when it had started it was no longer a mystery.

The mysteries of the trade become no mysteries; but are as it were in the air (Marshall 1890: 271).

The localised industrial atmosphere with localised knowledge contributed to the creation of new ideas, new business methods as a cumulative process in the district. Marshall’s argument was that once the local specialised clustering of economic activity had started, it became cumulative and socialised in the locality. However, Marshall could not explain why a

clustering process starts, why it starts in some places and not in others, and he could not explain what was meant by the concept of “local” (Martin and Sunley 2003).

Figure 6: Porter’s competitive diamond of local industrial clustering



Source: Martin and Sunley (2003: 9).

The author that more recently has received much attention is, as mentioned earlier, Michael Porter with his cluster concept (Porter 1990; 1998). The cluster concept Porter presented in 1990 was an industrial cluster. The concept lacked the geographical dimension and was spaceless. In 1998 Porter introduced this dimension, and the regional cluster model was born (Porter 1998).

today's economic map of the world is dominated by ... clusters: critical masses – in one place – of unusual competitive success in particular fields (Porter 1998: 78).

In a cluster there are sets of industries related by horizontal and vertical links of various kinds. Porter argues that there is interaction between four factors that constitute what he calls a “competitive diamond”, cf. the figure above. The four factors are: firm strategy, structure and rivalry; factor input conditions; demand conditions; and related and supporting industries

(Porter 1998). The more developed and intense the interactions between these four factors are, the greater the productivity of the firms. The main core of Porter's argument is that the companies in a cluster must have some kind of interaction, i.e. they must be linked. Clusters are characterised by both vertical linkages (buying and selling), and horizontal linkages (complementary products and services, the use of similar specialised inputs, technologies or institutions, and other forms of linkages). The intensity of the interaction within the diamond is enhanced in regional clusters because of the geographical localisation of companies.

Porter's argument is that spatial proximity matters both for competition and cooperation. Companies within a regional cluster both compete with each other and cooperate. Different kinds of companies are related to each other and other kinds of organizations in the region, such as universities, standard agencies and trade associations

Regional clusters are seen as a spontaneous phenomenon: a geographic concentration of firms often developed through local spin-offs and entrepreneurial activity. The cluster concept cannot explain why clusters come into being, but once the accumulation process has started, it can be used to explain the development of a cluster (Martin and Sunley 2003). This is a fate the cluster concept shares with Marshall's industrial district concept. The figure on the previous page illustrates that the Porter concept has similarities with Marshall's industrial district concept, but with one main difference, the demand factor. Martin and Sunley (2003) argue that Porter has reinvented and rediscovered Marshall's ideas.

Martin and Sunley (2003) have criticized the cluster concept for being so elastic compared to levels of region (regional, national and even cross border between nations) that it covers every form of agglomeration of industries. The cluster concept has also been criticised for a lack explanation of why the spatial and regional perspective is so important (Isaksen 2001).

The approach contains little systematic explanation of what exactly causes the spatial binding of economic activities within clusters besides the importance of spatial proximity (Isaksen 2001: 5).

Martin and Sunley (2003) further argue that the cluster concept has been marketed by Porter and other enthusiasts as a brand, rather than just another intellectual product. The core of the cluster concept is therefore more an image than a coherent and a carefully defined set of ideas (Martin and Sunley 2003).

The concept has acquired such a variety of uses, connotations and meanings that it has, in many respects, become a 'chaotic concept', in the sense of conflating and equating quite different types, processes and spatial scales of economic localisation under a single, all-embracing universalistic notion (Martin and Sunley 2003: 12).

The theory does not discuss knowledge creation in any profundity. Knowledge creation seems to be a result of the clustering effect along the horizontal dimension of the cluster. The observed effect is that as soon as one company has introduced a new product, other producers soon follow with new products, which can be slightly different from the original product, because the firms have added some of their own ideas to the product. This observed effect is explained by the agglomeration effect of many companies that makes it possible to observe each other and somehow to share information. However, the theory only explains the imitation and diffusion effects. It does not explain how new knowledge is created within the single firm or between co-operating companies. The knowledge creation process in the cluster is black boxed.

Neither does the regional cluster theory discuss the role of knowledge and university in any particular depth. According to Porter (1998), the universities' role is to educate candidates for the labour market. This implies that universities are treated in the same way as other factor conditions such as capital and physical resources, i.e. how efficiently and effectively the factors are used to gain competitive advantage for the cluster.

Despite this criticism, the cluster concept is still popular. In Norway one of the proponents of the cluster concept has been Torger Reve, who has conducted several national and regional studies (Reve and Jakobsen 2001). Even though the cluster theory does not discuss the role of university in any particular depth, it is a theory that has inspired policy makers both in the EU, on the national level in Norway and in the Agder region. More recently the cluster concept has been the model for a cluster organization of companies in the oil and gas cluster in Agder. From the policy makers' perspective the main interest is to try to establish clusters. In chapter seven I will show how the cluster theory inspires policy makers in Agder to challenge Agder University College. A theory that more explicitly discusses the role of university, industry and policy making is Triple Helix.

4.3 Triple Helix

This model was coined by Etzkowitz and Leydesdorff (1997), and the model has been invoked as an important expression of collaboration between the three actors: university, government and industry (Etzkowitz and Leydesdorff 1997; 2001; Lu 2006). The relationship between industry, government and university is explicitly stated. Industry is involved in research activities and government pushes the development of relationships between industry and university. Universities are taking on the role of industry and are becoming more entrepreneurial oriented and acting as consultants. It is a combination of the Mode-2 concept and a spiral mode of interaction between the three actors or “spheres”, which is the concept used by the Triple Helix proponents. The authors’ argument is that knowledge is created, and evolves over time, through the interaction between the spheres. The interaction results in new knowledge and in changes in the spheres, such as technology transfer between university and industry, government support for new innovation programmes, universities developing entrepreneurial strategies etc. (Etzkowitz and Leydesdorff 2001; Lu 2006). In the model university is regarded as an economic and entrepreneurial actor.

The Triple Helix gives no specification of how to establish a successful interaction between the three spheres. It is a theoretical model, and therefore lacks practice and empirical evidence (Lu 2006).

It just tells us that all the three elements in the model – university, industry and government – have to be involved in the interaction (Nilsson *et al.* 2007: 17).

The model black boxes the process between the three spheres. It seems to take for granted that knowledge creation happens when actors meet. The main question is how the intention of collaboration between the three spheres can be translated into reality (Lu 2006). The main findings from a study by Lu (2006) are that it is necessary to understand the changes, practice and dynamics involved in creating knowledge between the three spheres.

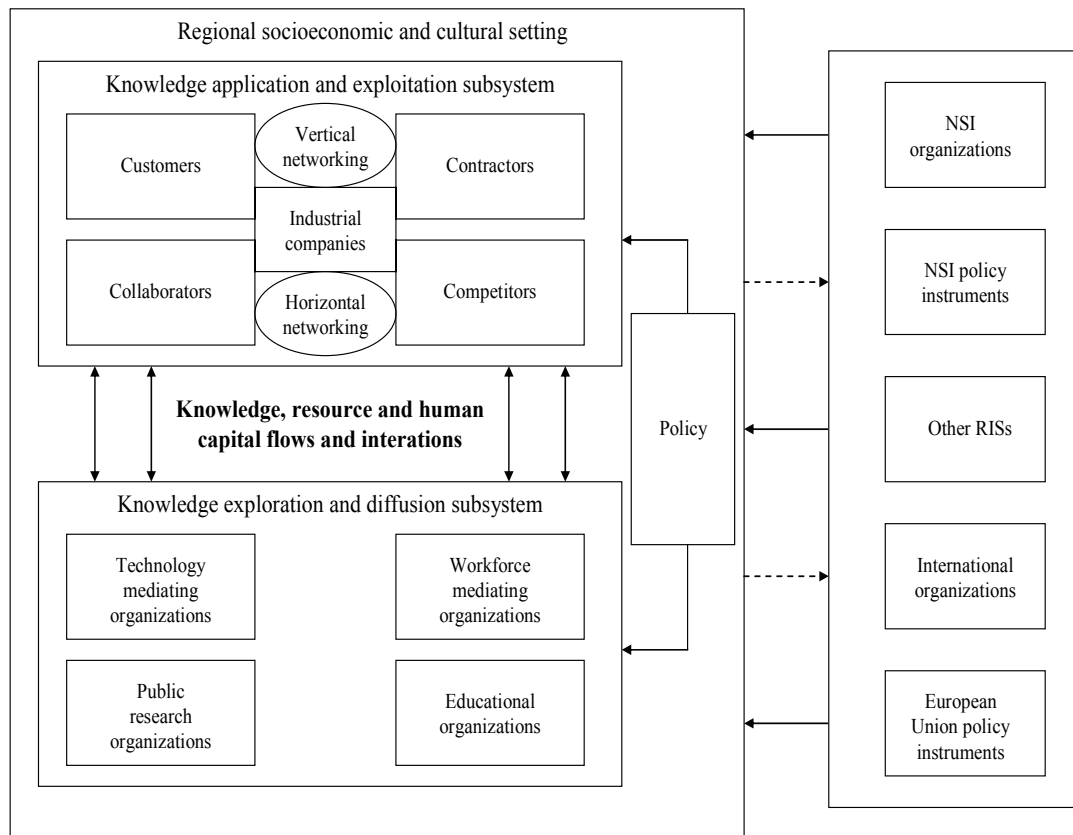
The dynamics involved in implementing Triple-Helix networks means that a more social and organizational dimension of innovation needs to be developed in order to enhance the understanding of how the strategic intention of creating knowledge-based innovation can be translated into operational practice (Lu 2006: 255).

The Triple Helix model does not grasp the complexities of creating knowledge between university, industry and government. It is a normative model that specifies that university, industry and government should cooperate. As a model for policy makers it may function, but as a model for implementing a system for knowledge creation between the three spheres the model seems to simplify too much to be realistic. The Regional Innovation Systems (RIS) approach is a better alternative, because the model offers a more elaborated perspective on the relationship between university, industry and policy making, with its differentiation in different sub-systems and its connection to the regional context. One difference between the RIS approach and Triple Helix is that the former does not discuss the role of government as explicitly as Triple Helix does. In the RIS approach the role of government is more indirectly discussed. The RIS approach is the next topic. The RIS approach is also less normative and does not see university as an entrepreneurial economic actor.

4.4 The Regional Innovation Systems approach

The RIS approach, or model, was coined by Phil Cooke in 1992 (Cooke 1992; Braczyk *et al.* 1998). The RIS model has developed from a national innovation approach towards a regional innovation approach (Braczyk *et al.* 1998; Asheim and Gertler 2005), and has developed from a linear perspective towards an interactive perspective (Tödling and Trippel 2005). The RIS approach has the region, regional innovation processes and the regional economic system as the subject of study. The main aim for the RIS approach is to understand and explain the region as an economic system for knowledge creation and regional development, and give policy recommendations.

The elements in the RIS model are illustrated in the figure below. The model is constructed as a three level system, with macro, meso and micro levels. The four macro elements are the socioeconomic and cultural setting in a region; the knowledge application and exploitation subsystem; the knowledge exploration and diffusion subsystem; and the policy system. In addition the RIS approach is connected to other RIS on national or international levels, and to policy makers on national and international level. Each macro element can further be differentiated on the meso level, such as companies with the roles of customers and supplies, or education and research institutions. The micro level is the concrete level where people from the different companies and organizations meet each other.

Figure 7: Main structures of regional innovation systems

Source: Tödling and Trippl (2005).

The RIS model incorporates elements from both cluster theory and Triple Helix. The cluster theory is integrated into the knowledge application and exploitation subsystem, while Triple Helix is the relationship between the different subsystems.

One difference between them is that the RIS approach emphasizes the regional socioeconomic and cultural setting in a region, because the approach builds on evolutionary theory (Braczyk *et al.* 1998). Compared with neoclassical economy, which assumes that economic agents are homogeneous, rational, and display non-opportunistic behaviour, the RIS approach:

gives particular emphasis to history, routines, and influences of environment and institutions (Braczyk *et al.* 1998: 7).

Braczyk *et al.* (1998) argue that the agent or actor in the RIS approach does not behave as “profit maximizers”, and even less tries to predict other actors’ behaviour because of uncertainty, bounded rationality and differences in expectations. The basic idea is that different kinds of actors with different kinds of knowledge create knowledge together. In this approach, knowledge and learning are more emphasized than in the cluster approach.

The development lag between countries and regions should not be understood as a product of lack of resources but of different organizational and technical capabilities to apply practical knowledge to existing resources in an up-to-date way (Braczyk *et al.* 1998: 8).

Such capabilities are path-dependent, but not predetermined (Braczyk *et al.* 1998). Regions can learn and change the course of a path (Florida 1995; Asheim 1996). In the EU the idea of constructing regional advantage has been launched by the use of the RIS approach (Asheim 2006).

The socioeconomic and cultural setting in a region is created and reproduced through the interaction between the actors in a region. The relationship has a historical dimension, constituted of former relationships and the interpretation of them, and current relationships (Braczyk *et al.* 1998). This constitutes the social environment or milieu in a region.

We are not talking about community in a simplistic way and a generic way, rather about routine practices and mentalities of entrepreneurship in the context of a commercial community (Braczyk *et al.* 1998: 9).

The proponents of the RIS approach argue that the social context matters, but how it matters can only be said after an intensive study of relationships in a concrete region. It is not possible to predict from studies in one region to another region. The combination of the concrete relationships will always be diverse in different regions.

The *knowledge application and exploitation subsystem* consists of companies, their clients, suppliers, and competitors as well as their industrial cooperation partners. These actors are connected in horizontal and vertical networks (Tödling and Trippel 2005). Horizontal networks are between companies of the same kind, while vertical networks are the value chain network. I will not go further into the subsystem because it has strong similarities with the regional cluster theory described earlier in the chapter.

The knowledge generation and diffusion subsystem consists of various institutions that are engaged in the production and diffusion of knowledge and skills (Tödling and Trippl 2005), such as university, research institutions, educational institutions, technology mediating organizations and workforce mediating organizations.

The *policy subsystem* has different roles. Its main role is to shape, formulate and implement regional innovation processes (Cooke, Boekholt, and Tödting 2000; Cooke and Memedovic 2003; Tödling and Trippl 2005). Asheim (2006) argues that, in order to construct regional advantage, it is important to strengthen the connection between the different subsystems.

A topic such as the connection between higher education and regional development has received less attention in RIS studies. The supplier role of candidates to the regional labour market appears to be understudied (Lawton Smith 2003; Hommen and Doloreux 2004; Asheim 2006). Providing the regional labour market with well educated candidates is considered as critical for enhancing the capacity of regional innovation (Hortz-Hart 2000; Asheim 2006).

Even though many RIS studies have been done, many of them have focused more on technology transfer from university, and the role of technology for regional innovation in companies. The simplicity of the linear transfer model has made it a powerful social construction because it is easy to understand. The model demonstrates where public resources should be used to increase innovation, and it also highlights the connection between basic research and innovation. However, the simplicity of the model is also the Achilles heel of the linear model, as it is just too simple; it does not reflect the complexity of the knowledge creation process, neither in nor between the different stages of the innovation process (Massey *et al.* 1992). Neither is generalizing from cases of exceptional universities, such as MIT in Boston or Stanford University in Silicon Valley in the US, to a more general role for all universities feasible. There is a huge difference between elite universities and regional universities. There is also a difference between the contexts many of the elite universities are located within and the host surroundings of regional universities.

Coenen (2006) argues that there is a need to develop a more nuanced analysis of the role of university in the RIS approach, which implies moving beyond an understanding of a linear

knowledge transfer from university, knowledge parks and science parks, and incubator centers (Coenen 2006).

The problem in the regional development theories, as with the Mode-2 concept, is that there is little discussion of how university can contribute with knowledge to regional actors. The theories are more or less black boxing the knowledge creation process between regional university and regional actors. None of the theories specifies how knowledge creation processes between regional university and regional actors actually happen. For instance, the Triple Helix model argues that it should happen, but without specifying how it should happen. The model does not specify how collaboration between the different actors could be functional, operational and implemented in concrete policy settings in order to construct regional advantage (Asheim 2006: 52). The regional development theories have an explicit focus on the regional dimension, which is the strength of the theories. Their weak side is that they black box the knowledge creation processes in the agora between university and regional actors. They lack a conceptualization of the concrete meeting in the agora between different kinds of actors.

4.5 The regional role of university

A discussion of the regional role of university must be related to the particular institution's host context. A part of the historical context is that the establishment of regional colleges in Norway in the 1970s was as an instrument for regional development efforts. Norwegian regional policy has a tradition of locating public institutions and industry in small places in Norway. Location of this kind for institutions and industry has been the reason for serious conflict and competition between regions and municipalities. By just being located in a region an institution has a considerable direct and indirect effect on the regional and local economy. I will call this effect the *passive location effect* of a university in a region. The passive effect means stable employment and stable taxes for municipalities and counties, in contrast to more insecure work places in industry dependent on natural resources. It contributes to increasing the size and the diversity of the local labour market, it attracts companies to the region that see the advantages in being located near a university, it expands the social and cultural environment of a region, and last but not least, it contributes with taxation through the employees. In addition there is the consumer effect. This is the money students and staff use

in the region. However, this passive location effect is no longer enough in the “knowledge economy”. Regional actors demand more from their university, a more active role, which is something new for university. There is a tendency that actors in the host regions ask the university to make an active contribution in regional development (Chatterton and Goddard 2000; Brulin 2001; Gustavsen 2003; Brulin 2004; Lantz and Totterdill 2004; Levin 2007). This active role of university has been given different names, such as the universities’ third role (Brulin 2001; Brulin 2004), the stakeholder university (Lantz and Totterdill 2004), the regional responsibility role (Levin 2007) or the regional development role. In the following I will use the term *regional role of university*. This covers the terms the universities’ third role, the stakeholder university and the regional responsibility role.

The argument for the regional role is that universities are not regarded as useful enough for their host regions. For instance, Levin (2007) argues that:

Knowledge development at universities has to a very high degree become knowledge production for its own sake, and not the creation of knowledge applicable to solve important social problems. ... The gap between what counts as knowledge at universities and what is useful for practitioners is too large. It is obvious that universities need to reach out and integrate in regional construction networks (Levin 2007).

By taking a regional responsibility, a university can produce socially useful outcomes and contribute to innovation processes, and their reward will be an increased income and a unique portfolio of learning and knowledge creation (Lantz and Totterdill 2004). The problem, according to (Lantz and Totterdill 2004), is that the individual firm and especially SMEs have little capacity to interpret and understand how the external world around them is changing. They therefore need help from external sources, such as universities. The university’s role should be to mediate knowledge to regional innovation processes. Knowledge is in this situation supposed to be generated through stakeholders.

In Sweden the regional role (third task) was launched in a Government Proposal in 1996/97 in addition to the earlier tasks, i.e. education and research (Brulin 2001; Brulin 2004).¹¹ The regional role obliges universities to relate to and collaborate with practitioners in the local community. The argument is that in order to be useful, research and education have to be created together with practitioners (Brulin 2004). This is in line with the Mode-2 knowledge

¹¹ In Norway the legislation for colleges and universities has been changed in order to get universities to collaborate in value creation processes. This happened first in 2002 with a later change in 2005.

creation argument coined by Gibbons *et al.* (1994). In Sweden a whole set of different means has been launched to increase the revenue of research and education (Brulin 2004). One idea has been to stimulate academic entrepreneurship and commercialisation of scientific ideas. The argument for this is that investment will create both scientific results and patents, which will attract venture capital, and create companies and new industries in the future. According to Brulin (2004) the large investments in life-science (biotech) and in telecom, information technology, media, and entertainment/education have so far not realised these expectations. Other ideas are the establishment of industrial research institutes, science parks and offices of collaboration (Brulin 2004). In Sweden the science parks are mainly dominated by the big Swedish companies, and they are mainly located in the parks because of recruitment of students (Brulin 2004). There have been new jobs created in the science parks, but only a low share has been created by spin-offs based on research innovation. For instance, spin-offs from traditionally big companies and students' spin-offs dominated in Mjärdevi Science Park, located at Linköping university (Brulin 2004). After the introduction of the regional role in Sweden there have been different kinds of administrative organizations established to run the collaborative task: offices of collaboration. These kinds of organization play an intermediary role between industry and university. One problem according to an evaluation is that these organizations run the risk of institutionalizing the regional role, thereby isolating university from collaborative processes with regional actors (Brulin 2004). Both education and research in universities will remain unchanged by such organizational solutions. This kind of solutions will risk overturning the regional role, rather than helping universities to fulfil the regional role (Brulin 2004). One problem with the regional role is that both in the UK and in Sweden, where universities have been allotted the regional role, there have been few resources earmarked for the task by the government (Lantz and Totterdill 2004). Another problem is that universities may see the regional role as a new income stream rather than a new task that requires change within universities.

There is a considerable risk that universities will focus more on third stream income generation to acquire resources rather than 'third task' engagement as a full partner in workplace innovation and regional regeneration (Lantz and Totterdill 2004: 204).

The main argument from Brulin (2004) is that the development of a set of means for increasing collaboration between university and industry in order to fulfil the regional role of university is not sufficient.

In the knowledge society it is the very process of knowledge formation that has to be changed (Brulin 2004: 179).

He argues that there is a need to influence the epistemology in universities and change it. This argument is not acknowledged by institutions such as the European Commission, which demands more cooperation between university and industry (Brulin 2004). Neither is this argument necessarily acknowledged by universities.

The above discussion shows that the regional role of university is an unclear concept. It is formulated as a normative obligation for universities to collaborate with regional actors, which seems to be an influence from the Triple Helix concept. However, the concept does not say anything about *how* university shall collaborate with regional actors. The concept lacks a discussion of what knowledge is, how knowledge creation processes are organized and designed, and how knowledge is created with other actors in the region.

Levin (2007) argues that reconceptualization of what counts as knowledge (from explicit knowledge to knowing how) and a new way of doing research is what is needed in universities. Both Gustavsen (2003), Brulin (2004), and Levin (2007) argue in favour of action research as an alternative epistemology, which can bridge the gap between universities and regional actors. I will present action research as an approach that can contribute to opening up the black box between university and regional actors, i.e. to explore the processes in the agora. Action research is the topic for the next chapter.

5. Organization of knowledge creation processes in the agora

My main aim with this chapter is to create an analytical model which I can use to analyse processes in the agora between university and regional actors. In order to do so I will discuss, from a pragmatic point of view, how knowledge creation processes can be organized and managed in the agora. In order to analyse these processes I will present action research as a methodology that has developed models for knowledge creation processes where the researcher is participating in the processes.

I will start the discussion with action research and participation in knowledge creation processes. Since action research is not well known outside the academic community I will use some time in presenting the approach. Action research is also an approach which is looked upon with scepticism within the academic community because of its methodology based on participation with practitioners. I will therefore use some time in presenting the historical heritage of action research before I present more modern models developed by action researchers. Two of the more modern models are Gustavsen's (1992) *Democratic Dialogue* and Greenwood and Levin's (1998) *Cogenerative Action Research model*. In addition to the action research models I will present a management approach, developed by Nonaka and Takeuchi (1995) *The Knowledge Creating Company*, which discusses the relationship between the organization of processes and the specific outcome from knowledge creation processes. A specific design decides the specific outcome is the message from the authors.

After the presentation of the action research models I will present both an analytical model, which is founded on the previous theoretical discussion, and a typology for analyses of knowledge creation processes in the agora. The chapter ends with a summary of the previous theoretical discussion and my main research questions, which prepare the ground for how I have generated data and how I have analysed them in the coming chapters.

5.1 Action research and participation

I have chosen action research (AR) as my main method for data generation. AR rests on the ethos of participating with practitioners. As a participant the action researcher has the potential to acquire a holistic picture of the process rather than partial perspectives represented by most other methods. Without action and participation AR would have been applied research or spectator based research, and without research AR would have been consultancy (Greenwood and Levin 1998). A participant in a process obtains another kind of data than is possible to generate via interviews, surveys and document studies. However, these latter methods can be combined with an action research approach, which I have used. In chapter six I will say more about the method I have used.

The term participant covers both the action researcher and the practitioner. A *practitioner* is a term that denotes a problem owner, someone who has a problem or faces a challenge and wants help from an outsider to change the situation. The problem owner can be an organization, a local community or someone in a project. It is the ethos of participating with the problem owner in society that separates AR from spectator based research approaches (Greenwood and Levin 1998; Reason and Bradbury 2001; Herr and Anderson 2005). The latter approaches usually have a more distanced and observation-based role as researcher of a social phenomenon. Participating means that the researcher acts (participates) with the practitioners, i.e. acts with them in the knowledge creation process. It is not possible to participate without acting. Action is therefore an integrated element of an action research process. The action researcher can be in a position as an insider, an outsider or somewhere between in the process (Greenwood and Levin 1998; Herr and Anderson 2005). As an insider the researcher places the practitioners, at the centre of the research, but to the disadvantage of other important stakeholders, such as clients and other community members (Herr and Anderson 2005). According to Herr and Anderson (2005) this approach, often named practitioner research or teacher research, has gained popularity in the US. In the Scandinavian countries and in Norway especially, the action researcher as a friendly outsider that collaborates with the insiders is a more common role (Greenwood and Levin 1998). To participate as an action researcher you have to be invited into a process. Without this invitation there is no action research process. An invitation into a process implies that the role of the action researcher has been discussed and defined. Without a clear understanding of the role from the beginning the action researcher can experience problems later in the process.

The role of the action researcher in a process can vary from full control over the process to a role as an equal participant with the other participants. In both positions the researcher represents an external knowledge base, which can be divided into a theoretical part and an action part. The former is the theoretical knowledge the researcher has created in a codified form from processes s(he) has participated in. The latter is the kind of knowing how and tacit knowing the researcher brings into the process. The researcher can contribute with his knowing in planning processes, s(he) can facilitate specific phases of a process such as organizing or leading an event where the different participators meet each other. The researcher can also follow a process and in specific phases reflect together with the participants about the process. This latter method is called trailing research and is often used in connection with the evaluation of processes (Finne, Levin, and Nilssen 1995). In some of the processes in the agora I have participated and reflected together with the participants.¹²

The action research theories and their authors that I will now present are all within the American pragmatist tradition. The American philosopher John Dewey (1859-1952) was one of the proponents of the pragmatist tradition. One of Dewey's most characteristic features was his steadfast refusal to separate thought from action; for him everything was forged in action (Greenwood and Levin 1998: 73).

He believes that the only real sources of knowledge are to be found in action, not in armchair speculation. For him, all knowledge testing and proofs are experimental activities (Greenwood and Levin 1998: 73).

For a pragmatist thinking is also action. When an action is complete and the outcome is different from the expected outcome, a pragmatist starts thinking why this happened and through actions tries to find out what caused the outcome. For a pragmatist and an action researcher, action is the only way of generating and testing new knowledge (Greenwood and Levin 1998). The pragmatist tradition claims that the value of knowledge is equal to its practical use.

I will now present different designs of knowledge creation processes. I will start by presenting an organizational design where the researcher has full control over the situation. The prototype of this situation is the classic experiment which Kurt Lewin redesigned for field experiments. The field experiment is an applied version of the classic experiment (Gustavsen

¹² In chapter nine I will present two knowledge creation processes I have participated in.

1992). Lewin is regarded as one of the founders of AR (Greenwood and Levin 1998). He is also regarded as one of the classics besides Max Weber in the organizational change literature (Hatch and Cunliffe 2006).

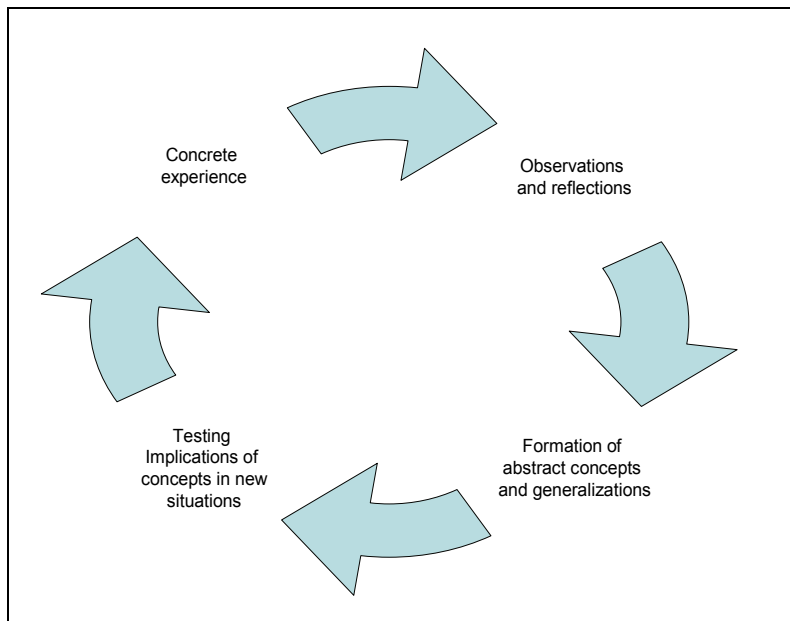
5.2 The Lewinian experiential learning model

Action researchers are usually seen as proponents of change processes. Kurt Lewin was a social psychologist, with a central interest in social change and especially in how to conceptualise and promote change. One of his first studies is the use of tripe as a part of a regular daily diet for American families instead of beef (Lewin 1943). He conceptualised change in a three-stage process. First, he studied natural behaviour in an experimental situation. Then he acted (intervened) by introducing a change in the situation. Finally, he studied the consequences of the intervention. This is a methodology that rests upon the assumption of causality between variables, and the possibility to control all other variables so that they will not have an effect on the outcome. The beef, tripe and families are seen as entities, which can be manipulated with the purpose of explaining the mechanisms involved.

He used his experience from the experiment to introduce a theory of social change in organizations in the 1950s. In his theory he defined stability as a stalemate between forces for change and forces against change (Hatch and Cunliffe 2006). His argument was that a social situation can best be understood if a change is introduced into it, and its effects are observed.

The best way to understand something is to try to change it (Greenwood and Levin 1998: 19).

His theory offered prescriptions for how to manage instability in order to change a situation. The model Lewin developed has been used in many case studies (Hatch and Cunliffe 2006) and the model has also inspired later action researchers. The experiential learning model has been developed from group dynamics (Kolb 1984). Experiential learning is an integrated process with four phases (Kolb 1984). It begins with here-and-now experience, i.e. concrete experience, such as work experience. The next phase is observation, reflection and collection of data about the experience. The data are then analysed and constructed as abstract concepts and generalizations. The last phase is the feedback to the actors and discussion of the findings with them, and possible modification or change in the actors' behaviour.

Figure 8: The Lewinian experiential learning model

Source: Kolb (1984: 21).

The experiential learning model depicts learning as a process of conflict, confrontation and resolution among four basic adaptive ways of relating to the world; Concrete Experience versus Abstract Conceptualization, and Active Experimentation versus Reflective Observation (Kolb 1984). The model emphasises that learning and change result from the integration of concrete emotional experiences with cognitive processes: conceptual analysis and understanding. Action research is the experiential learning model's practical counterpart (Kolb 1984).

Knowledge is continuously derived from and tested out in the experiences of the learner (Kolb 1984: 27).

Learning as a process views ideas and thoughts as formed and re-formed through experience (Kolb 1984). Experience is the source of learning as a continuous process.

The experiential learning model has been developed further by action researchers such as Chris Argyris and Donald Schön in the US, Bjørn Gustavsen in Norway and Davydd Greenwood from the US and his polymath, Morten Levin from Norway. Lewin's method and mode of constructing knowledge was used in the Norwegian Industrial Democracy Project and still has influence among many US-based organization development practitioners (Greenwood and Levin 1998). The authors argue that this is a very limited and mistaken

position for AR, and they argue for a continuous and participative AR process, and not short-term intervention.

For us the change process has an open starting point and often no absolute final goal (Greenwood and Levin 1998: 18).

By participating in a process the action researcher can help to improve the capacities of the participants so that they can have the option of increasing control over their own situation (Greenwood and Levin 1998). Intervention is still a concept used by action researchers, but the content of the concept has changed to a more participative and less authoritative one than Lewin originally formulated. Today intervention is understood as participation and cogeneration of knowledge between participants (Greenwood and Levin 1998).

The Lewinian experiential learning model with feedback processes between concrete experiences, observation and reflections, formulation of abstract concepts, and testing of concepts through actions is still used. The difference between different kinds of feedback processes was used by Argyris and Schön (1996) when they created Model I and Model II learning.

5.3 Model I and Model II learning

Argyris and Schön (1996) Model I and Model II learning is based on the simple observation that there is a difference between what people say and what they do. They distinguish between two kinds of theories of action: *espoused theories* and *in-use theories*. The former are the argument a person gives for his action in a given situation; i.e. the reasons (s)he communicates to others for the action.¹³ The latter are what the person actually does. There may be a difference between what a person says and what s(he) actually does. In this case, there is a difference between the person's espoused theory and theory-in-use. The latter are the tacit, taken for granted theories or knowing that guide the person's action. In the following I will use taken for granted knowledge as synonymous with tacit knowing. The person is not necessarily aware that s(he) behaves in another way than s(he) argues.¹⁴

¹³ The interview is one method for generating espoused theories.

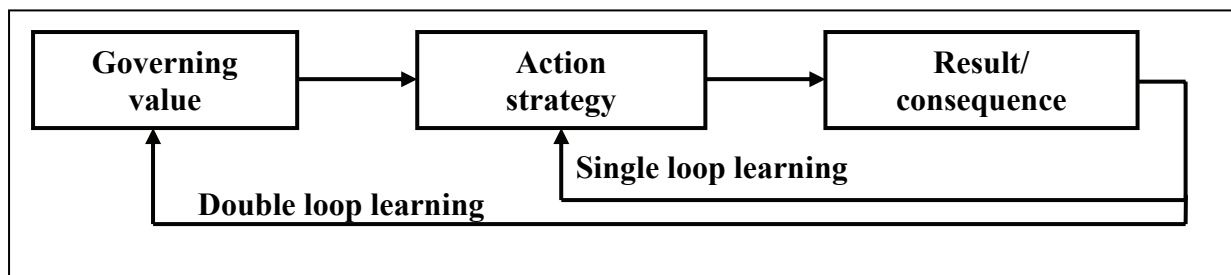
¹⁴ The difference between a communicated argument for an action, and the action in itself, can only be identified through a combination of interviews and observation. The latter will uncover the specific theories-in-use.

When someone is asked how he would behave under certain circumstances, the answer he usually gives is his espoused theory of action for that situation. This is the theory of action to which he gives allegiance, and which, upon request, he communicates to others. However, the theory that actually governs his actions is his theory-in-use (Argyris and Schön 1974: 6-7).

The difference between espoused theory and theory-in-use may or may not be bad for a person or an organization. It is when the difference becomes too wide that difficulties can arise. However, this divide can be used in a positive way, as an experience of surprise, which is the mismatch of outcome to expectation. This is essential for the process by which people can come to see, think and act in new ways (Argyris and Schön 1996: xxiii).

For Argyris and Schön (1996) learning seems to imply detection and correction of error. The mismatch can be corrected through a reflection process, such as single loop learning or as double-loop learning: cf. the figure below. In single-loop learning, individuals, groups or organizations modify their actions according to the difference between expected and obtained outcomes. An unintended consequence is identified and corrected by an action, such as when a thermostat identifies that the air is too cold or too warm and corrects the situation by increasing the heat or turning the heat off. Single loop learning occurs when, for example, goals, values, frameworks, and strategies are taken for granted. The focus is on the techniques and the efforts of making them more efficient, not on questioning them. Single loop learning corrects the observable results, not the more basic problems that caused the problem in the first place. The basic problem is not necessarily solved by single loop learning. In the worst case it may only be a short time correction, because this kind of learning does not ask why the problems occurred in the first place. To do that it is necessary to look at the hidden elements or governing values that caused the unintended result (Argyris and Schön 1996). The challenge is to identify the governing variable or value behind the action.

Figure 9: Double loop and single loop learning



In double-loop learning the values, assumptions and policies that led to the actions in the first place are questioned and if the persons, who are questioned are able to view and modify their actions, then double-loop learning has taken place. Double loop learning is the reflection process about single-loop learning. Double loop learning occurs when the underlying tacit assumptions are detected and corrected in ways that involve the modification of an individual's or an organization's underlying norms, policies and objectives (Argyris and Schön 1996). Double loop learning is necessary for informed decisions in rapidly changing and complex contexts. A person can be unaware of their theory in use, or worse they can be aware of it, but they have developed defensive actions and routines that cover their actions (Argyris 1990; Argyris and Schön 1996).

The distinction between the two theories is used to develop two models, Model I and Model II (Argyris and Schön 1996). In Model I the theories-in-use are shaped by the ambitions of winning or of avoiding embarrassment. Both action strategies are defensive actions that do not solve the riddle or the tacit structure governing the action (Argyris 1990). Model I is based on the assumption that all people have developed a common theory-in-use in special situations that may inhibit double loop learning.

Model II is the situation where theories-in-use enhance double loop learning. Model II is a strategy for intervention in order to change the learning process from Model I to Model II. Dialogue and questions about the arguments in a field experiment are the strategy for the invention of the governing value (Argyris and Schön 1996). In the field experiment the action or the event is brought into a real life situation, a real change for those involved. The field experiment is the link between theory and practice (Gustavsen 1992). The field experiment is dependent on an external instructor as a mediator for the intervention process. The instructor's role is to help the participants to take the first step towards change and then help them further in the transition from Model I to Model II learning. Inquiry through dialogue between the instructor and the participants is the way for transition. Inquiry, in the spirit of Dewey, is:

the intervening of thought and action that proceeds from doubt to the resolution of more doubt. Doubt is constructed as the experience of a "problematic" situation, triggered by a mismatch between the expected results of action and the results actually achieved. Such a mismatch – a surprise, as we experience it - blocks the flow of spontaneous activity and gives rise to thought and further action aimed at re-establishing that flow. Inquiry does not become organizational unless

undertaken by individuals who function as agents of an organization according to its prevailing roles and rules (Argyris and Schön 1996: 11).

The authors argue that there are no fixed ways means for transition, except for some guidelines for effective learning (Argyris and Schön 1974: 98). The most important guideline is to create an environment for free-flowing behaviour between the participants. The trick and the challenge are to get the participants to act as in a normal, real life situation where the difference between their espoused theories and their theories-in-use is demonstrated in action. The action researcher's (facilitator) role is to identify this behaviour, and then demonstrate it for the participants, and get them to look forward by predicting the consequences of their behaviour on themselves and their environment. Then the instructor helps the participants to look back and examine the governing values of the behaviour and identifies the feedback that keeps the actor resistant towards the change.

One problem with Argyris and Schön's (1996) approach is the role of the action researcher, i.e. the facilitator. Their theory is developed within a US management tradition. The contrast with Scandinavian working life tradition is considerable. Argyris and Schön's (1996) theory seems to imply that the facilitator knows the "right" answer, i.e. what the wrong single loop is and what the right double loop is. The field experiment is designed as an authoritative, top down approach seen in relation to the participants in the learning process. How can the facilitator know the "right" answer? And even if he knew the "right" answer, who has given him the right to superimpose the answer upon the people involved? (Gustavsen 1992) The authoritative answer to these questions resulted in the abandonment of the field experiment as a research strategy. Action researchers, such as Gustavsen (1992) and Greenwood and Levin (1998) in Scandinavian working life and research tradition emphasize a democratic dialogue between participants and researchers about the challenge before any other action is taken. The process rests on the principle of participation by those affected by possible outcomes from the process. They are bottom up models for both the organizational design of process and for change.

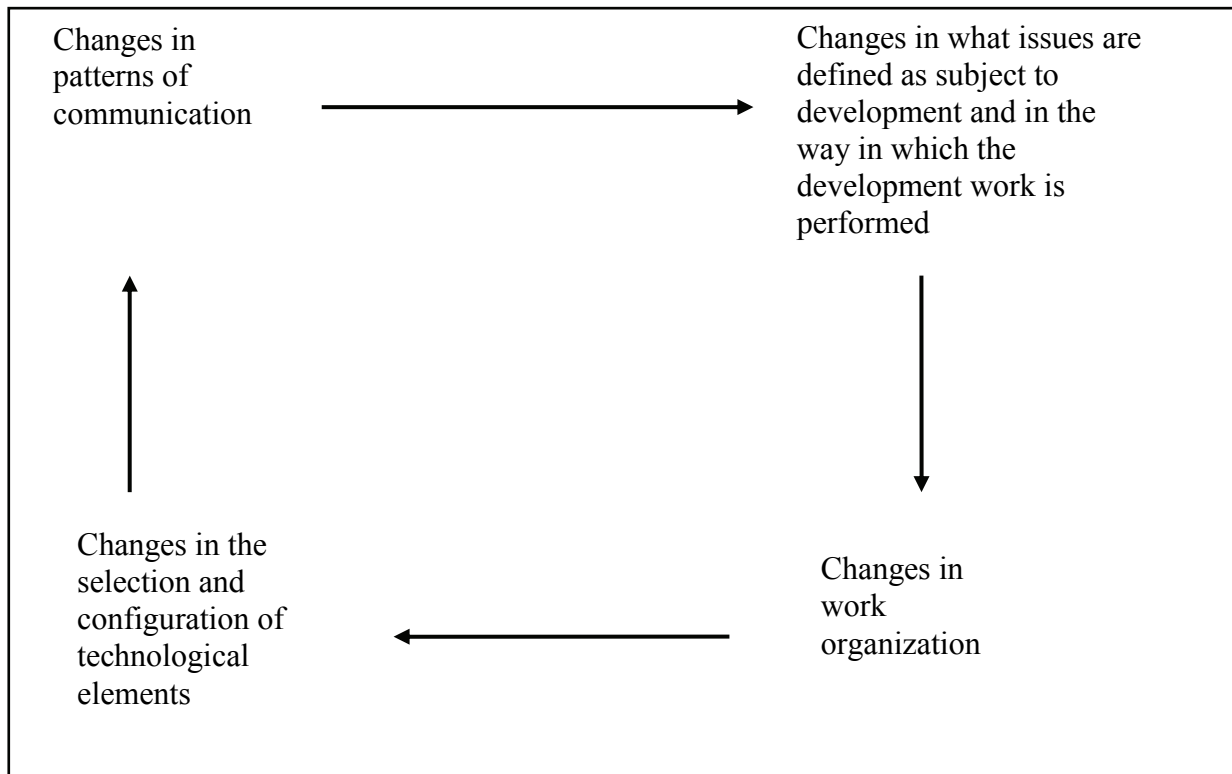
5.4 Dialogue and development

The book *Dialogue and Development* by Gustavsen (1992) is one of the classic works in the Scandinavian, and in particular the Norwegian, working life research tradition (Johnsen 2001). The book is a result of reflections from a Swedish working life programme in the latter half of the 1980s.¹⁵ Gustavsen's (1992) analytical concept for organizational development and change is *democratic dialogue*. Organization development is connected to language, organising of democratic dialogue processes in and between enterprises and change in practice in the enterprises. The focus of the importance of language has also been known as the communicative turn in action research and working life research (Johnsen 2001). The main argument is to link people to each other through a process of shared meanings where the research process is merged with a process of restructuring of language which encompasses those who have to understand the research (Gustavsen 1992: 33). According to Gustavsen (1992) this can be done through a dialogue between a group of people where all participants share an interest in creating "a good language". He admits that change in language and the use of words is not enough. The change in language must be connected to practice, through a process of understanding.

Understanding is seen as linked to language, which in turn is linked to practice. Language, and hence understanding, can be changed, but only – in principle – by a mutually dependent development of language and practice where the dependence is mediated by dialogue (Gustavsen 1992: 36).

¹⁵ The programme was called *LOM*, which stands for "Leadership, organization and codetermination". The programme involved about 150 enterprises and had a four year cycle.

Figure 10: The Relationship between change in communication and change in work organization



Source: Gustavsen (1992: 70).

In order to secure an open and free floating dialogue the concept of democratic dialogue is introduced and operationalised with 13 criteria (Gustavsen 1992). Knowledge in the form of *work experience* is the basis for participation. Gustavsen (1992) argues that this is the only type of experience, which, by definition, all participants have. Other criteria for participation are:

- It must be possible for all participants to participate.
- The possibility to participate is, however, not enough. Everybody should also be active. Consequently each participant has an obligation not only to present their ideas but also to help others to contribute their ideas.
- All participants are equal (Gustavsen 1992: 3).

He does not elaborate on what he means by “equal”. One interpretation is that he means that the participants are considered as equal in the understanding that the participants have the

same right to participate and argue in the dialogue. With regard to the dialogue, he writes that it is seen as a process of exchange of ideas and arguments that should move to and fro between the participants (Gustavsen 1992). He further argues that the points, arguments, etc, which are to be included in the dialogue must be made by a participating actor. Nobody can participate “on paper” only. Each participant must accept that other participants can have better arguments, and the participants should be able to tolerate an increasing degree of difference of opinion.

The dialogue must continuously produce agreements which can provide platforms for practical action. Note that there is no contradiction between this criterion and the previous one. The major strength for a democratic system compared to all other ones is that it has the benefit of drawing upon a broad range of opinions and ideas which inform practice, while at the same time being able to make decisions which can gain the support of all participants (Gustavsen 1992: 3-4).

Gustavsen’s (1992) principles meet the criticism I raised in chapter 3.4 *The agora*, of the Mode-2 concept. The principles are a guideline for the specification of rules and procedures for the knowledge creation process, for how tensions are to be handled, and for which kind of knowing how that can be involved in the process.

He underlines that the criteria are meant to be a preliminary operationalisation, and not a final list. However, as time has passed the criteria have been known as Gustavsen’s (1992) 13 principles for democratic dialogue. They are ideal principles and procedures for *how* to participate in a dialogue, and *who* can participate in the dialogue. They are not principles that make it possible to interpret the intentions of the participants in the dialogue or to help separate a good argument from a bad one (Johnsen 2001). In the information box below a concrete design of a dialogue conference is described, based on Gustavsen (1992).

Information box 1: Design of a dialogue conference

A *dialogue conference* is a meeting between people, organized and administrated by external resources such as an action researcher, but where it is the participants from the enterprises, who constitute the main actors and resources (Gustavsen 1992: 42). The participants are a slice of the functions of an enterprise: Line management, staff and experts, first line supervisors, employee representatives, and one or two shop floor workers without any representative role. In the LOM programme four and four enterprises participated, each with 7 to 10 participants at the conference.

The time perspective for the whole conference is one and a half days and it usually takes place at a conference centre. The number of external resources reflects the number of groups; i.e. four groups in the conference imply four researchers. In contrast to Argyris and Schön's (1996) role of the active researcher, the researcher's role is calmer. They are more in an observer role. Nor do they sit in the groups the whole day, but go to and fro between them.

The programme for the conference consists of a short introduction of some minutes with information about the basis for the programme and some administrative information. There is no round table presentation. Since the participants do not know each other in advance, they would not remember each other anyway, Gustavsen (1992) argues. The knowledge about each other is supposed to emerge stepwise as the conference unfolds. In the group work, the participants can give a short presentation of themselves and the enterprise they represent. The first topic, or question, is what an enterprise should be like in five years' time in order to be a good enterprise and workplace. The issue is discussed in homogeneous groups, i.e. line managers, staff and experts, supervisors, union representatives, and ordinary employees. The aim is to start the dialogue in an environment of people with shared interests and let them discuss for an hour or so.

The next topic is what problems will be encountered in trying to make real the vision of the good workplace. This time the group is divided in diagonal arenas where employees from one enterprise meet managers from another enterprise. The purpose is to create an open debate that also can include some of the basic issues in management-worker relations.

In the third round, the participants are asked to develop ideas and suggestions for improvement of their situation and problems. The arena is composed of participants according to the topic of the round in order to maximize the likelihood of generating ideas. Gustavsen's (1992) experience from the LOM programme was that this was the most complicated round. It turned out to be hard to construct ideas for the participants. The researchers therefore intervened and instead of starting with group work, they started with a brief introduction to the session in the form of a summing up of what had emerged from the previous sessions and what potential perspectives they could give to future discussions. The researcher's role seems to be more active in the plenary sessions than in the group work in order to make the dialogue more concrete.

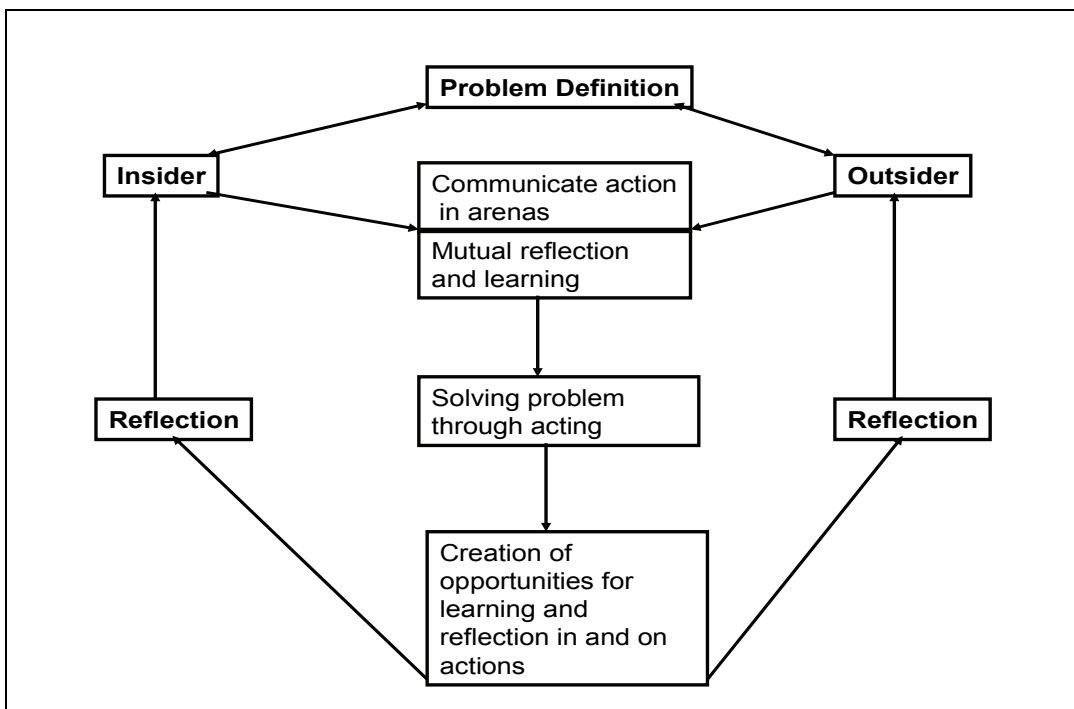
In the last round the arena is organized around the members from the single enterprise, with the aim of discussing possible projects that can represent possible steps towards a good enterprise and workplace. The outcome from this round is supposed to be as explicit as possible, especially in creating direct participation from those involved

All sessions are followed by plenary reports of ten minutes from each group in the form of short summaries such as overheads and flipovers. The group reports constitute the backbone of the conference report put together by the researchers.

5.5 The cogenerative action research model

The cogenerative action research model as Greenwood and Levin (1998) call it, consists of two analytical phases, cf. the figure below. The means in the process is communicative action. The aim of the process is, in the first phase, to clarify an initial research question, i.e. to find out *what the aim of the process is*. The transition from the first phase to the second phase occurs when the insiders (the problem owners) and the outsiders (researchers) have reached consensus about the problem definition. The second phase is through a dialogue between the participants to find a solution and test the solution through action(s), i.e. to find out *how we are going do it*.

Figure 11: Cogenerative action research model



Source: Greenwood and Levin (1998: 116)

The cogenerative model emphasizes that scientific knowing like all other kinds of knowing is a result of continuous cycles of action and reflection. The solutions achieved are only the best possible at that moment (Greenwood and Levin 1998), which is in line with the pragmatic foundation of action research. This implies that there may be other solutions, but at that period of time, this is the best solution the participants have found and the solution they agree on. The final test of the solution is by testing it out in practice and reflecting on the outcome of the action. Was the action in line with the expected outcome or did the action create another

outcome? This cycle of reflection on the outcome can in turn create new cycles of reflections and actions.

The action research models presented by both Greenwood and Levin (1998) and Gustavsen (1992) focused mostly on experience from the processes. They are more concerned about the local knowledge and help the participants to reflect on this knowledge to see if there could be solutions to local problems found. The next model I will present is developed by organizational management researchers. The model focuses both on learning processes and on the outcome of learning processes. The SECI model¹⁶ is developed by Nonaka and Takeuchi (1995) and presented in their book *The Knowledge Creating Company*.

5.6 The SECI model

The SECI model is regarded as an important contribution to the management literature about knowledge and learning in organizations (Levin and Klev 2002). My main interest in the model is that the authors combine a learning approach with a knowledge approach, even though I do not agree with their distinction between explicit and tacit knowledge: cf. the discussion in chapter two. This implies that I do not share the author's view of the knowledge concept they use in the model. However, I must acknowledge that the model has a dynamic element in the combination of learning and knowledge that can be used to understand knowledge creation processes and output from such processes. This is my main reason for presenting the model.

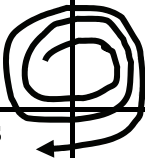
The authors differentiate between different phases of knowledge creation and different kinds of knowledge as output from the process. The concepts of socialisation, externalisation, and internalisation are the same concepts that Berger and Luckman (1966) use to explain reality as a social construction.¹⁷ Metaphor and analogy are methods used in theory construction by social constructivists, such as Knorr-Cetina (1981), where she writes about the manufacturing of knowledge.

¹⁶ SECI is an acronym for Socialisation, Externalization, Combination and Integration.

¹⁷ The authors refer to Berger and Luckman (1966) on page 59, when they discuss knowledge as a social reality. However, Nonaka and Takeuchi (1995) do not refer to Berger and Luckmann (1966) later when they use the concepts internalization and externalization, which are central concept in the latter authors work: *The Social Construction of Reality*.

The SECI model describes both knowledge creation processes and the output from the knowledge creation processes (Nonaka and Takeuchi 1995). The model is developed from studies of Japanese companies. The authors emphasise that the aim of the model is to make tacit knowledge explicit so that the whole organization can use the knowledge. The main message from the authors is that an organization must be aware of tacit knowledge as an important asset. Tacit knowledge is as important as explicit knowledge and must be seen as an integrated part of a knowledge base in a company. Tacit knowledge is regarded as an individual asset by the authors. To become an organizational asset the individual tacit knowledge has to go through a process of knowledge conversion. Through this process tacit knowledge becomes explicit. When it has become explicit it can be diffused through the organization. The authors use the concept of knowledge conversion to describe a four stage process (mode) of interaction between tacit and explicit knowledge, cf. the figure below. The spiral in the figure demonstrates the dynamic relationship between tacit and explicit knowledge. The four modes of knowledge connect, interact and construct different kinds of knowledge in the spiral. The spiral becomes larger as it diffuses through the organization, and can trigger off new spirals of knowledge conversion as the process moves through the organization.

Figure 12: Knowledge conversion (SECI model)

	To		Explicit
From			
Tacit	Socialization which creates sympathized knowledge		Externalization which creates conceptual knowledge
Explicit	Internalization which creates operational knowledge		Combination which creates systemic knowledge

Source: Nonaka and Takeuchi (1995: 72)

Socialization is the process of sharing experiences or transfer of knowledge. An individual can acquire tacit knowledge through working together with others and observing what they are doing, imitating them and practicing together with colleagues. The knowledge created through this process is called sympathized knowledge, such as shared mental models and technical skills (Nonaka and Takeuchi 1995).

Externalization is a process of articulating tacit knowledge into explicit concepts and knowledge by the use of different techniques, such as metaphors, analogies, concepts, hypotheses, or models in a collective reflection process. According to the authors, externalization holds the key to new knowledge because of its ability to create new explicit concepts from tacit knowledge. The trick is a sequential use of metaphor, analogy, and model in a meaningful dialogue and collective reflection in an organization (Nonaka and Takeuchi 1995).

Combination is a process of systemizing and combining different kinds of codified knowledge into a knowledge system. Formal education, such as an MBA, is an example of this kind of knowledge construction. Through the education process the students learn how to sort, categorise, combine and reproduce different kinds of theoretical knowledge (Nonaka and Takeuchi 1995).

Internalization is a process of embodying codified knowledge into tacit knowledge. When experiences through socialisation, externalisation, and combination are internalized into individuals' tacit knowledge bases in the form of shared mental models or technical know-how, they become valuable assets as operational knowledge (Nonaka and Takeuchi 1995: 69).

The role of the facilitator separates the action research approaches from Nonaka and Takeuchi's (1995) theory. In the latter approach, the role of the facilitator is internal in the company. It is the management (top or middle) in the company that decides if, when, and how a knowledge conversion process is organized, and who is going to have the responsibility for the design of the process. The management are the knowledge facilitators in Nonaka and Takeuchi's (1995) theory. The authors argue that Japanese firms generally develop internal mechanisms for knowledge construction, while Western companies use external resources, such as researchers and consultancy.

Nonaka and Takeuchi's (1995) work demonstrates that the design of the knowledge creation process is important. If the aim is to create conceptual knowledge the process must be designed in a different way than if the aim is to share knowledge in an organization. This implies that there is a relationship between design of a process and the kind of knowledge created in the process.

I will now design an analytical model which I will use in analysis of knowledge creation processes in the agora between Agder University College and regional actors in the Agder region.

5.7 Creation of a model to explore the agora

The agora is the place where university and regional actors meet each other. In the agora the regional role is played out by university. The agora is a place for organizational action; it is not only a collection of individuals. There is a difference between individual and organizational action:

Organizations are not merely collections of individuals, yet there is no organization without such collections. Organizational actions cannot be reduced to the actions of the individuals, even of all the individuals that make up the organization, yet there is no organizational action without individual action (Argyris and Schön 1996: 8).

There are a lot of different components and conditions that connect and overlap in the concrete meeting between university and regional actors in agora. I will use the term *organizational conditions for knowledge creation* in this dissertation. The following list is not in any way exhaustive, but is more an illustration of possible dimensions and dichotomies that may influence a concrete process:

- *Characteristics of aims*: short versus long term, simple versus complex, routine versus innovative.
- *Individual characteristics of participants*: Male versus female, young versus old, student versus researcher, manager versus researcher, well educated versus poorly educated, long work experience versus short work experience, university rector versus managing director, managing director in a small company versus a big company, management versus worker.
- *Organizational characteristics of participants*: Small versus big company, knowledge intensive company versus knowledge extensive, entrepreneur versus a well established company.
- *Financing characteristics*: High versus low budget.
- *Physical conditions*: Good versus bad meeting facilities, such as meeting rooms with or without air-conditioning, well versus badly equipped regarding technical devices such as computers, telephones, audiovisual aids etc.

- *Institutional legitimacy*: High versus low, old versus new.¹⁸

The organizational conditions constitute the framework for a process. The combination of the conditions I will call *organizational design*, which refers to how work is best organised (Hatch and Cunliffe 2006). This is a practical approach we all meet in our daily life, from the organization of family life to the organization of meetings between university and regional actors. The study of organizational design can be about how change occurs or how it can be managed (Hatch and Cunliffe 2006). It is the latter part I am most interested in, i.e. how processes between university and regional actors are organised and managed. I will divide organizational design into four elements:

- 1) participants and their knowing how
- 2) the organization and planning phase of a process,
- 3) cogeneration of knowledge, and
- 4) the outcome from the process.

The first three elements are dynamic, which means that they connect in a process. The last element is knowledge in the form of a codified product (data, information and theoretical knowledge) or as knowing how and tacit knowing.

Every process needs *participants*. The process in the agora is between participants from university and the region. They represent an organization, and they bring with them their individual knowing how. Later in the chapter I will differentiate between two different kinds of participants: researcher and management.

In the *organization and planning phase* the process is prepared and planned with, for example, invitations to participants, booking of meeting facilities, design of time for the whole event, design of the meeting programme with time for each activity such as speeches, group work, plenary sessions etc. In this phase the rules or procedures for the knowledge creation phase is discussed and formalised, so that the participants knows the rules in advance. Gustavsen's (1992) 13 principles for democratic dialogue and design of a dialogue

¹⁸ In chapter three I used institutional legitimacy as a concept to discuss the challenges of university. Processes in the agora need legitimacy from its respective organizations, and from its environment. Without legitimacy the processes in the agora cannot function. The legitimacy governs the processes in the agora through codified rules or informal rules.

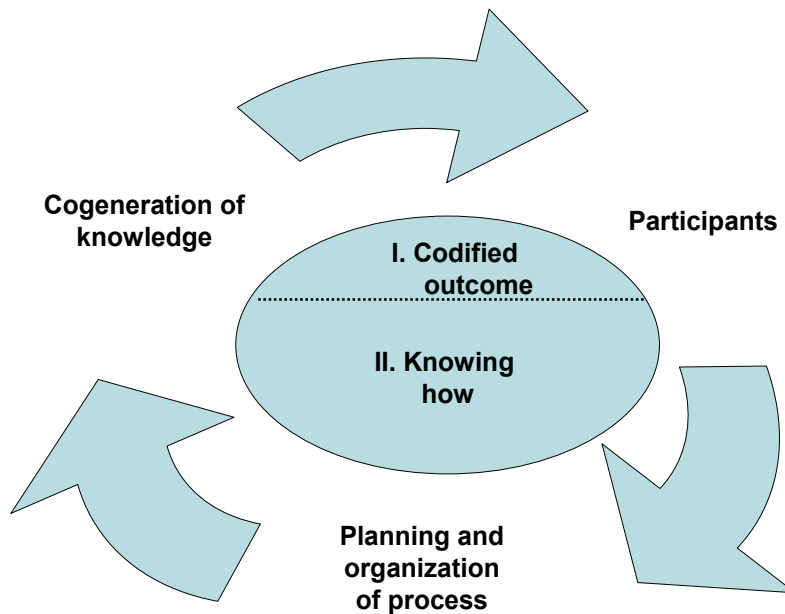
conference is one guiding star for the planning and organization of the process. Another is two analytical phases in Greenwood and Levin's (1998) action research model.

Cogeneration of knowledge is the knowledge creation process between participants in the agora. It consists of two analytical phases for the generation of knowledge, cf. the cogenerative action research model (Greenwood and Levin 1998). Cogeneration of knowledge gives the possibility of improving or changing the action, if necessary during the action, and changing the outcome of an action. In actions, such as in a meeting, participants have the time and possibility to reflect. They can reflect when others are talking. They can reflect on what the process and atmosphere in the meeting are like, and they can reflect on what they are going to say in the meeting as a response to what others have said, and their reflections or other people's can change the process and the outcome of the meeting.

Most processes have some kind of organizational design. Each process is a function of a combination of specific organizational conditions and the concrete design of a process. This unique combination has specific consequences for the knowledge creation process and the kind of knowledge created in the process. In the figure below, the organizational design conditions are shown. The codified outcome from a knowledge creation process is only the top of the iceberg. As with the iceberg, where most of it is below the sea, most of the outcome from a knowledge creation process is not possible to codify. This is illustrated in the figure below.

A process can be good or bad depending on the combination between institutional legitimacy and organizational design. A leadership problem between managers needs another design than an organizational development process (Greenwood and Levin 1998). In the former case, the management team designs the process, while in the latter case the whole organization should be involved.

Figure 13: A model for organizational design of knowledge creation processes in the agora



As noted in chapter four, the regional role of university in knowledge creation processes can be discussed from different approaches. It is difficult to distinguish an organization, such as a university, from its environment. The borders between a university and its surrounding society are becoming transgressive (Nowotny *et al.* 2001). The borders demarcating the one from the other are disappearing. The previous strong borders between university and the private sector are being penetrated by new circuits of knowledge (Slaughter and Rhoades 2004). As Hatch and Cunliffe argue:

Take the university as an example and consider the case of students. Are you a member of the university? Are you a customer? A raw material? A product? Each answer is accurate in some way and, what is more, each suggests a different definition of what lies inside and what lies outside the organization. ... Drawing a boundary around an organization is a difficult exercise and the implications of various definitions for different decision-making situations must be taken into account when you make an analysis (Hatch and Cunliffe 2006: 64).

An organization, such as a university, a company, or a public organization is continually constructed and reconstructed by the members of the organization and others in the environment of the organization. I assume that a university is a complex organization. A complex organization consists of:

nets of collective action distinguished by artefacts and meaning related to that action (Czarniawska-Joerges 1992: 186).

These nets of action go in many different directions both within university and out of university into the agora where they meet actors from the region. In the agora, people from different organizations and with different kinds of knowledge meet each other with the purpose of creating knowledge together. My main research interest is to study the meeting between university and regional actors in the agora. I will therefore differentiate between actors from university that participate in processes in the agora, and between individually and collectively organised processes. Actors from university can be differentiated in management- and researcher-initiated processes. Management in this connection means the board, the rector, the university director's office with the university director, the research director and other officials in his office. Researcher processes are either research or teaching initiated processes.

A collectively organised process means that there are different kinds of actors involved from AUC, and that the process is formally organized. By individually organized processes I mean that the processes mainly are organised by a single person from AUC in connection with actors from the region and that the processes are more informal. The two dimension actor and organizational design can be combined into four typologies, cf. the table below. A typology is like a description of a "unique combination of attributes" (Doty and Glick 1994).

Typology I is *strategically organized processes*. These are processes decided by the board, where they have initiated the process, appointed participants, and given it a mandate. The term "strategically" points to the organizational design of the process. The participants in the process must regard knowing how as of strategic importance for the theme or subject area they are going to discuss in the process. The process must also be planned and organized with the aim of strategically creating knowledge for decision makers in the organization. The cogenerative phase must be designed for this aim; i.e. that the participants first have a process where they discuss what they are going to do, and when they have reached agreement, they start to discuss how they are going to solve the mandate.

Table 5: Four different kinds of processes in the agora

Actor	Management	Researcher
Organizational design		
Collective	I. Strategically organized processes	III. Collectively research organized processes
Individual	II. Management organized processes	IV: Individually research organized processes

Typology II is *Management Initiated Processes*. These are processes initiated by the university director's office where the university director has decided to initiate processes, and where it is the university director or someone in his office, such as the research director or the executive officer at the research director's office, that leads the processes. It is the management that designs the process and chooses the participants in the process.

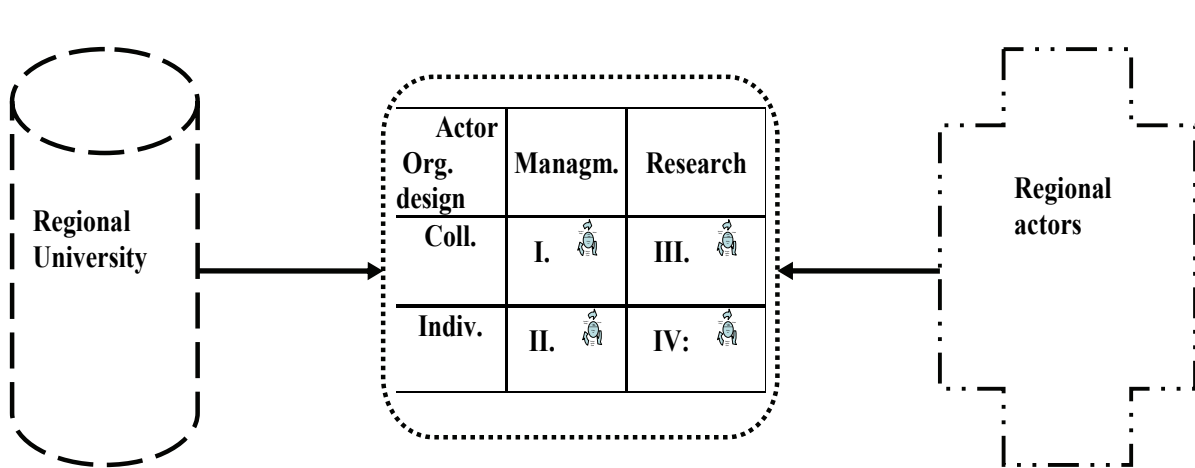
Typology III is *Collectively Research Organized Processes*. These are processes initiated, planned and organized by researchers which involve other researchers, students and staff at university and regional actors. These processes are at the core of the mission of university; i.e. either research or education. The main aim of these kinds of processes is to create data, information and theoretical knowledge in a codified form.

Typology IV is *Individually Research Organized Processes*. These are processes outside the core of the mission of university, but which involve researchers and their knowledge in processes with regional actors. They are initiated, planned and organized by the individual researcher. The aim of the process is decided together with the regional actor.

I have in the previous chapters criticized both the authors behind the Mode-2 concept and the regional development theories for black boxing the agora and the knowledge creation processes between university and regional actors. Since I have done this I will present my approach to opening up the black box. I will use the typology I created to map processes in the agora. In order to analyse the processes I will use the model for organizational design of knowledge creation processes in the agora. This is illustrated in the figure below. I have used

a modified version of the figure from chapter three. The modifications are that the labels university and society have been changed to regional university and regional actors, and that the typology is placed into the agora.

Figure 14: A model for mapping and analysing processes in the agora



The regional role is played out in the agora. Mapping and analyses of different kinds of processes will give knowledge about the regional role of university. In the next chapter I will describe more specifically how I have created data in order to answer my research questions. Before I turn to the next chapter I will summarise the theoretical discussion in the previous chapters, and formulate more concrete questions connected to the agora between Agder University College and the Agder region.

5.8 Summary

My main research question stated in the introduction is the following:

1. *How is knowledge created in the agora between a regional university and regional actors?*

I also stated three more concrete questions, which I have explored in the theoretical discussion:

- a. *What* main forms of knowledge are created in the different processes? The ambiguity of the term knowledge creation makes it necessary to examine the term more closely.
- b. *Why* is University College by society and by regional actors? A challenge can be formulated in different ways and with different arguments. Whatever the formulation of the challenge, there is a need to know more about the arguments behind the challenge.
- c. *How* are knowledge creations processes in the agora between university and region organised? The assumption of a complex organization implies a diversity of processes in the agora, which in turn implies a theoretical discussion of how such processes can be analysed.

I will now briefly sum up the previous theoretical discussion, where I have answered the three more concrete questions.

In the introductory chapter I presented my thesis statement, and defined my stance as one within critical realism, but towards the borders of the discourse approach. Each chapter has been used to sharpen the focus of my study and my main research question. I started with a discussion of what knowledge creation is. In the knowledge discourse, knowledge is a much used concept, but it is also a blurred concept. This was the main reason for discussing knowledge creation, and making the distinction between the two dimensions of knowledge. The first dimension is the codified outcome from a knowledge creation process, which are data, information and theoretical knowledge. The second dimension is knowledge in action, which is knowing how.

The discussion was then connected to the university discourse and the fact that a “new” mode of knowledge creation, Mode-2 knowledge creation, is challenging the “old” mode of knowledge creation in society, Mode-1. In the “new” mode, knowledge is created in a context of application, which is faster, more efficient and more useful for the knowledge users. Mode-2 challenges university, since university mainly creates knowledge in Mode-1.

University is challenged by society and by actors in the host environment of university. Regional actors demand a university that is engaged in knowledge creation processes in their host environment; they do not want a university detached from regional challenges in their region. They want researchers from university to participate in knowledge creation processes

in the agora. The Mode-2 argument represents a new discourse about university, which challenges the Humboldtian discourse about knowledge creation as *Bildung*. Despite the strong argument for a new mode of knowledge creation, the authors of the concept do not say much about the process of knowledge creation. They just state that knowledge is created in a context of application and that transdisciplinary knowledge is involved in the process. My argument is that Nowotny *et al.* (2001) black box the knowledge creation process in the agora. This is a fate the Mode-2 concept shares with the cluster model, Triple Helix and the RIS approach. Of all the regional development theories the Triple Helix concept is the one that discusses the role of university most explicitly. Triple Helix states normatively that university should collaborate with industry, but the concept does not indicate how university should participate with industry. The regional role of university is an unclear concept because it lacks a discussion of what knowledge is, how knowledge creation processes are organized and designed, and how knowledge is created with other actors in the region.

In this chapter I have discussed how knowledge creation processes in the agora between university and regional actors can be organised and designed. I presented different action research models and a management model. In the last part of the chapter I created a model with four elements of a knowledge creation process. The elements are: participants, organization and planning of a process, cogeneration of knowledge and outcome from the knowledge creation process. And finally I presented a typology with four different kinds of processes, which will be used to analyse knowledge creation processes in the agora.

The typology I have created will be used to analyse knowledge creation processes in the agora between Agder University College and regional actors in the Agder region. As a way of illustrating and illuminating these questions, I want to look into knowledge creation processes between Agder University College and actors in the Agder region. The concrete questions are:

- *Why* is Agder University College challenged by regional actors? I want to find out who is challenging Agder University College. I want to find out which ideas and/or theories that they are using to challenge the college with.
- *How* are knowledge creations processes in the agora organized and planned by Agder University College? I want to map the processes in the agora. I also want to see how the different processes between Agder University College and regional

actors are organized, and who is participating in the processes. I also want to study some processes more in depth, and see how they create knowledge together.

- *What* main forms of knowledge are created in the different processes?

Theoretically I have differentiated between codified outcome and knowing how and tacit knowing. I also want to see if it is possible to identify the main forms of knowledge created in the different processes.

By answering these more concrete questions I will try to answer my main research question.

In the next chapter I will describe how I have connected these concrete questions with data.

6. The applied method used in the study

The time has come to connect the discussion in the different theoretical chapters together with a presentation of how I have generated the data for the analysis to come in the next chapters. In order to carry out my study I have generated three different sets of data: cf. the table below. My main research strategy is to start with the regional challenge, and then move towards more and more specific processes between Agder University College and regional actors.

The first data set is from the regional level, and is an example of a strategically organized process. The main participants in the process are Agder University College, industry in the region, the Competence Foundation, which is a policy maker in the region, and the regional newspaper, which has been a facilitator of the process.

Table 6: Organization of the data sets

Actor	Management	Researcher
Organizational design		
Collective	I. Strategically organized processes - Data set one: A regional challenge for Agder University College - Data set two: Organization of processes in the agora	III. Collectively research organized processes - Data set two: Organization of processes in the agora - Data set three: A study of two knowledge creation processes
Individual	II. Management organized processes - Data set two: Organization of processes in the agora	IV: Individually research organized processes - Data set two: Organization of processes in the agora

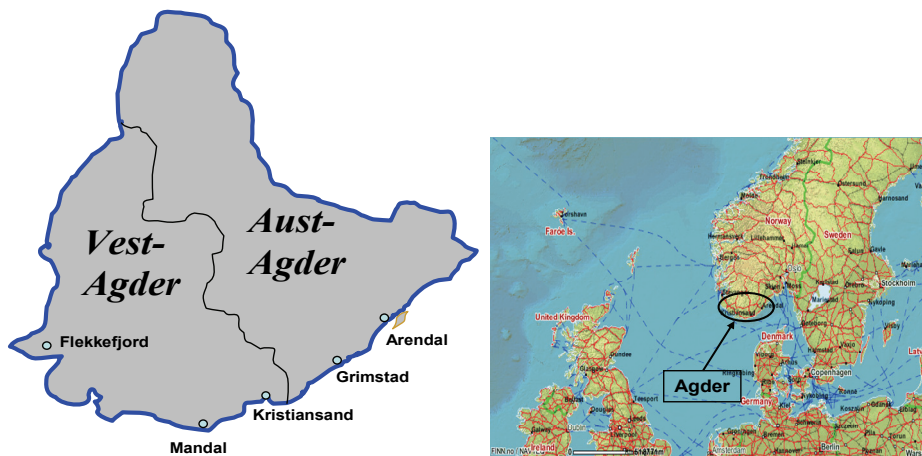
The second data set is from a mapping of processes between Agder University College and regional actors. In connection with the mapping I have used the typology developed in chapter five. The third data set is from collectively research organized processes between actors from Agder University College and companies in the region. Since I wanted to participate in some processes the challenge has been to identify processes, and be invited into them. This is easier said than done. I have data from one process, which I have participated in, and from one process where I followed some students.

The further discussion is divided into these three parts. In each of them I present how I have generated data from different kinds of processes in the agora. Each discussion starts with a short theoretical introduction before I present the data. Before I describe how I have generated the data sets, I will present the Agder region and Agder University College.

6.1 The Agder region

The region consists of the two counties of Aust-Agder and Vest-Agder. Most of the population in the region lives along the coast. The population in the region was about 266,000 in 2006. This is 5.7 percent of the total population in Norway (4.6 million inhabitants), which makes the region one of the smaller ones in Norway. The region is also known as the Sunbelt in Norway because of its warmer summers compared to other regions in the country.

Map 1: The Agder region in relation to the regions of Europe



Half of the population in the region lives in the towns of Arendal (38,826), Grimstad (19,224) and Kristiansand (76,917). The region has 30 municipalities, and the average population in the municipalities is about 8,800 inhabitants. This implies that there are a lot of small municipalities in the region.¹⁹

¹⁹ The reason that Mandal and Flekkefjord are shown on the map is that I will refer to these two municipalities later in the study.

In table 2 below, employed persons for Agder by industry division, and percentages for Agder and Norway are shown. The structure of the employment is similar to the main structure of Norway, with some exceptions. There are more people employed in manufacturing and oil and gas in Agder (15 %) than the average for Norway (12.9 %). The same applies to the construction business, Agder 8 % versus 6.8 % for Norway. There are fewer people employed in real estate, renting and business activities in Agder (8.1 %) than the average for Norway (10.1 %). There has been a change from a traditional industry structure to a more knowledge intensive industry structure in the region.

Table 7: Employed persons 16-74 years, by industry division. 2005. Absolute numbers and relative shares.

Industry division	Agder	Agder %	Norway %
Agriculture, forestry and fishery	3 140	2.6 %	3.4 %
Manufacturing, mining, extraction, incl. oil and gas	17 911	15.0 %	12.9 %
Electricity and water supply	620	0.5 %	0.7 %
Construction	9 527	8.0 %	6.8 %
Wholesale and retail trade, and hotels and restaurants	21 923	18.3 %	18.4 %
Transport and communication	8 041	6.7 %	6.9 %
Financial intermediation	1 807	1.5 %	2.0 %
Real estate, renting and business activities	9 744	8.1 %	10.6 %
Public administration and defence	7 039	5.9 %	6.6 %
Education services	10 553	8.8 %	7.9 %
Health services	24 509	20.5 %	19.3 %
Other services	4 298	3.6 %	4.1 %
Unknown	694	0.6 %	0.4 %
Total	119 806	100.0 %	100.0 %

Source: Statistics Norway

In the table below the total number of establishments, by size groups for employees, is shown for Agder and Norway.

Table 8: Establishments, by size groups, Agder and Norway. 2007

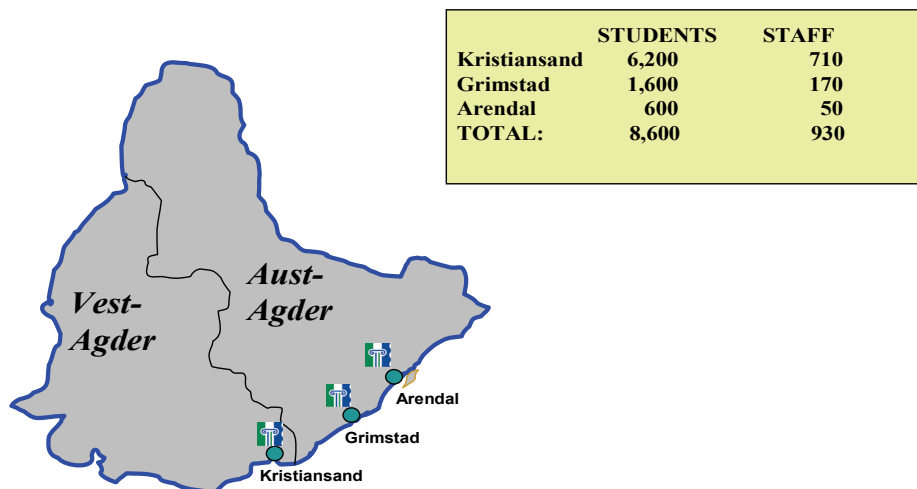
	Number of establishments		Agder share of establishments in Norway
	Norway	Agder	
Companies	469 795	26 038	5.5 %
No employees	291 548	15 880	5.4 %
1-4 employees	94 248	5 308	5.6 %
5-9 employees	37 050	2 185	5.9 %
10-19 employees	24 550	1 411	5.7 %
20-49 employees	15 160	869	5.7 %
50-99 employees	4 553	259	5.7 %
100-249 employees	2 076	102	4.9 %
250 employees and above	610	24	3.9 %

Source: Statistics Norway

The structure of establishments is dominated by small companies both in Agder and in Norway. About 90 percent of the companies have from zero to nine employees. The share of companies with over 250 employees is less than one per cent of the total share of companies.

6.2 Agder University College

Agder University College (AUC) is one of 25 university colleges in Norway, and one of the largest. In 2006 there were 8,600 students and 930 employees at the college. 510 man years are involved in research. The university college offers 14 Master's programmes of five years' duration and 42 Bachelor's programmes of three years' duration. AUC offers PhD education in four subjects. The number of students has increased from 6426 in 2001 to 7717 in 2005. The majority of the students are Bachelor's students. In 2005 there were about 6,400 Bachelor's students, about 900 Master's students and 42 PhD students. The professional programme students dominate among the Bachelor's students. As in other university and university colleges in Norway there is a majority (58 %) of female students in Agder University College. The female students dominate in the Bachelor's programmes, but in the Master's programmes male students dominate. The female Master's students constitute only 41 % of the total number of Master's students.

Map 2: The Agder region with the location of Agder University College

Agder University College has three campuses, cf. map 2. The main campus is in Kristiansand, which has the majority of the students and staff: 6,200 students and 710 staff. The two other campuses are in Grimstad, with the Faculty of Engineering and Science, and Arendal where the Faculty of Health and Sport is located. The board decided in 2006 to shut down the campus in Arendal and build a new campus in Grimstad. The new campus will be finished in 2009.

Table 9: Faculty, researchers and share of researcher

Name of faculty	Number of researchers	Share
Health and Sport	92	18.0 %
Fine Arts	54	10.6 %
Economics and Social Sciences	98	19.2 %
Engineering and Sciences	85	16.7 %
Humanities	95	18.6 %
Mathematics and Sciences	55	10.8 %
Education	31	6.1 %
Total	510	100.0 %

Agder University College has seven faculties. The largest faculties measured by the number of researchers are the Faculty of Economics and Social Sciences (School of Management), the

Faculty of Humanities, and the Faculty of Health and Sport measured by the number of researchers employed at the faculties.

In the following discussion I will describe how I have connected the research question with the data sets I have generated. I have emphasized describing *how* I have generated the different kinds of data, what kind of challenges I have met in the process, and which decisions I have taken. My account aims to demonstrate the validity of the data. Generation of data implies many decisions because not all kinds of processes and not all kinds of outcome from knowledge creation processes can be studied. Neither is it relevant to study all kinds of processes and outcomes. My challenge has been to explain as much as possible with as little data as possible (King, Keohane, and Verba 1994: 29). This has been my guiding star in the data generation process.

6.3 First data set – A regional challenge for Agder University College

The argument from Nowotny *et al.* (2001), presented in chapter three, is that socially robust knowledge is created in the agora. Both the Mode-2 concept and the regional role of university are used as arguments to challenge university. A challenge implies that someone, in this case, Agder University College, is challenged by someone else in the agora. A challenge implies an answer from the challenged, which may trigger a new response from the challenger. A challenge may trigger a discourse between university and regional actors. (The concepts of discourse, dialogue and debate will be used as synonyms in this dissertation.) The theory discussed in the previous chapter gives a clue to the answer: that the challenge comes from the new, emerging legitimacy of university.

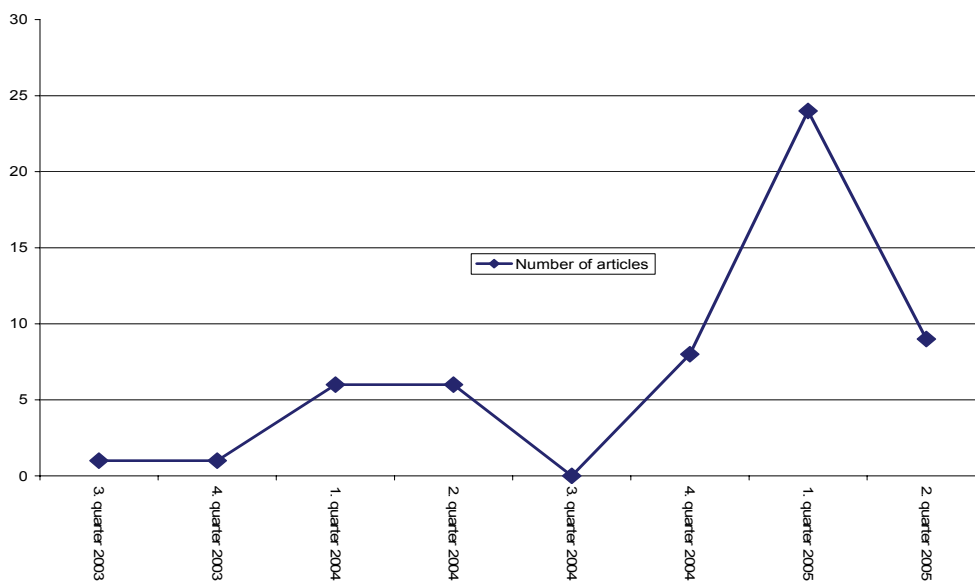
My main questions are:

- a. *Why is Agder University College challenged by regional actors?*
- b. *Who is participating in the discourse?*
- c. *What kind of knowledge is created in the agora?*

My main aim is to demonstrate and discuss the challenge, and relate it to the previous theoretical discussion about knowledge creation in the agora. One thing is to discuss theory and formulate questions, another is to identify a challenge. However, I have been lucky. During my study there was considerable newspaper debate about the role of Agder University College, which I have decided to use as data in my analysis. I regard a newspaper debate as one kind of process in the agora. It is public, it is easy to get access to, it is easy to observe, and it is possible to participate if so wished. However, since I was involved in a data generation process in AUC at that time, I decided not to participate in the newspaper discourse. The data is in codified form and it is easy to generate the information and use it in further analysis.

In the figure on the next page I have shown the development of the discourse with regard to time and the number of articles in the regional newspaper *Fædrelandsvennen*. From September 2003 to May 2005 there were 55 articles which had some kind of relevance. The main criterion for an article to be counted as being about AUC is that AUC is mentioned in the article, and that the content of the article is about the regional role of the university college. The figure shows that there are two peaks in the number of articles. The first peak is in the first and the second quarters of 2004, and the second is approximately one year later, and is much greater than the first peak. The peaks indicate that something special happened.

Figure 15: Number of newspaper articles in *Fædrelandsvennen* from the second quarter of 2003 to the second quarter of 2005



However, a mapping of the number of articles does not say anything about the content of the debate. The peaks indicate that something triggered a lot of articles in the newspaper. In the table below I have sorted the different kinds of article according to the type of actors that participated in the discourse. A newspaper article can be written by a journalist, the editor of the newspaper or as a letter from a reader, who can be a regional actor or an actor in AUC. The increase in the number of articles is mainly a result of letters to the editor from persons in AUC and regional actors.

Table 10: Participants in the newspaper discourse

Kind of article	Letter from representative in AUC	Letter from regional actor	Report in <i>Fædrelandsvennen</i>	Leader in <i>Fædrelandsvennen</i>
3rd quarter 2003	0	0	1	0
4th quarter 2003	0	0	1	0
1st quarter 2004	2	0	2	2
2nd quarter 2004	2	1	2	1
3rd quarter 2004	0	0	0	0
4th quarter 2004	2	1	4	1
1st quarter 2005	10	6	7	1
2nd quarter 2005	3	1	4	1
Sum:	19	9	21	6

After I compared the content of the different kinds of articles, I decided to use the reportage articles since they covered my main interest in the regional role of Agder University College. I have further selected the reportage articles where the rector is interviewed by a journalist, or is participating in a debate with regional actors. I then selected six newspaper articles and went more deeply into them. The articles show a development and a dynamic in the discourse. The main topic in the discourse was the role of Agder University College in the region. The article with participants and the content of them will be presented in the next chapter with the heading: *A regional challenge for Agder University College?*

One weakness in using newspaper articles is that the presentation of what the different actors said is not necessarily accurate. They probably said more than the journalist uses in the article. On the other hand it is easy to gain access to the discourse and it is possible to see whether the discourse had any impact on regional strategies in AUC, which is the next topic.

6.4 Second data set - Organization of processes in the agora

My main interest is to try to map the processes between Agder University College and regional actors in the agora. The main questions formulated in the introduction chapter are:

- a. *How are knowledge creation processes with regional actors organized at Agder University College?*
- b. *Who is participating in the processes from AUC?*

The table below shows the number of interviews I did from mid November 2003 till June 2006: a total of 123. In the table below I have categorised the interviews by the kind of actors and the kind of function the interview subjects had. Interview subjects from AUC are divided into three groups: administrative staff, researchers and students, and the regional actors are divided into three groups: industry, financial institutions and public sector. All the interviews done with regional actors were with management.

Table 11: Qualitative interviews done in the period November 2003 – June 2006.

Interviewees	Number of interviews
Administrative staff AUC	17
Researchers AUC	29
Students AUC	53
Industry	21
Financial institutions	1
Public sector	2
Sum:	123

Seen in retrospect, the number of interviews is maybe too high. I have used quite a lot of time in generating data, and I should have used more time in analysing the data I had generated already. In action research project is difficult to say which kind of data that can be useful because I have been trailing processes. Even if I have not used all the data I have generated they have contributed to providing me with a rather good insight into AUC and the different kinds of processes between AUC and the region.

The method I originally planned to use in the data generation was a survey for researchers and management in Agder University College, in combination with some qualitative interviews. A survey is a good method for creating a lot of data, but the challenge is to formulate good questions because this affects the answers. I therefore decided first to do a pilot study with one faculty. I started by asking for information about projects the faculty was working on with the region, such as partnership agreements. I called key persons in the faculty administration, because I thought they had an overview of projects, or at least would know who I could talk to. I was quickly directed to the faculty director. I introduced myself and my research project and asked if she could supply information. She replied that she was not negative to my request, but that she needed documentation about my project, and what information I wanted from the faculty. I therefore had to make a formal request. I found that reasonable, and said that I would send the request by e-mail the same day, which I did. I waited a few days for the answer, and then I called the faculty director again. She assured me that my request was lying on her desk and that she would respond as quickly as possible. That was the last time I heard from her. I never got an answer from her. I then realised that I had to change my research strategy, but I was not sure in which direction.

During my study I have had regular interviews with the research director at AUC. I started and completed my data generation in the form of interviews with him. The first interview was in November 2003 and the last was in June 2006. Altogether I had eight interviews with him. In one of our meetings, I told him the above story and asked him how I could get information from the faculty. He could not give me advice on what to do about the faculty's lack of cooperation, but he suggested an alternative solution. He told me that the public relations manager at the university director's office had been given the task by the rector of mapping the relationship between AUC and the region. He recommended I should present my study to him and tell him about my struggle to get information from the faculty. I then made an appointment with the public relations manager, and introduced myself and the project. We discussed the matter, and I was then invited to join the project.

The duration of the project was about one and a half months. We started the planning in December 2004, and presented the main findings to the rector in the first half of February 2005. We decided to use qualitative interviews. I offered to make a suggestion for an interview guide, and he arranged the appointments with representatives from the different faculties and departments. The structure of the interview guide is shown in the information

box below. The guide is a result of a combination of the public relations manager's needs and my research needs. He wanted information about the public sector and the communication of popular science to the host region. My need was to know more about the knowledge concept, and we shared a common interest in knowing more about AUC's relationship with industry. The concept we used in the interviews to map the agora was cooperation. This is a concept that covered both our needs, and it was a concept that was easy to communicate to the interview subjects. In addition we also wanted information about how the projects with regional actors were financed. The concept cooperation means the same as participation and collaboration.

Information box 2: The structure of the interview guide

1. Interaction with business
 - Cooperation
 - Knowledge
 - Financing
2. Interaction with the public sector
 - Cooperation
 - Knowledge
 - Financing
3. Engagement in projects in the region
4. Communication of research to society and the Agder region (popular science).

The cooperation point included questions such as:

- What is the purpose of the cooperation?
- Who do you cooperate with?
- What kind of cooperation do you have?
- Is the cooperation formalised in, for example, a partnership agreement or is it more informal?
- Is the cooperation active for the moment or is it inactive?
- What is your experience of the cooperation?

The knowledge point included questions such as:

- What kind of knowledge is created in the cooperation?
- How do you document the created knowledge?
- How many Master's and Bachelor's projects are created each semester/year?
- What kind of knowledge is AUC offering business/the public sector?
- What is the most important knowledge that AUC can contribute to business/the public sector?

The financing point included questions such as:

- Who is financing the cooperation?
- How many Norwegian *kroner*?

In January and February 2005 we conducted 22 interviews. The table below specifies the interviewees involved, their faculty and function in the faculty. Each interview took between one and one and a half hours. All field notes were hand written, and later coded and analysed further.

One question that came up in one of the first interviews was my role in the project. The interviewee reacted negatively to the information that I was participating with the public relations manager. He said that he would have answered differently if I have been alone. He did not explain what he meant by his comment. One interpretation is that he would have been more honest in his answers if I had been alone. He was one of the few interviewees that I knew personally, as I had cooperated with him in my work at Agder Research. Even though the interview started in an atmosphere of tension, it changed after a while to a more open and free dialogue. By the end of the interview we had obtained the information we needed, and we were satisfied. I am not sure if I would have more got more useful information for my project if I had been alone with him. As a result of a tight interview schedule, I decided not to take on another interview with him. None of the other interviewees reacted to my collaboration with the public relations manager.

Table 12: Interviews done in connection with mapping of relationship between AUC and actors in the Agder region in January and February 2005

Faculty	Dean	Faculty director	Programme coordinator	Sum
Economics and Social Sciences	0	0	5	5
Faculty of Technology and Science	1	1	2	4
Health and Sport	0	0	4	4
Humanities	0	0	4	4
Education	1	1	0	2
Fine Arts	1	1	0	2
Mathematics and Sciences	1	0	0	1
Sum	4	3	15	22

The interview subjects represented positions as dean, faculty director or programme coordinator. Most of the interviews were done as single interviews. Two of the interviews were done as focus group interviews with the dean and faculty director and one was done as a

focus group interview with two study programme coordinators from the Faculty of Technology and Science. All the interviews were done during the time when the newspaper discourse was at its peak, cf. Figure 15: Number of newspaper articles in *Fædrelandsvennen* from the second quarter of 2003 to the second quarter of 2005. Many of the interviewees commented on the newspaper discourse during the interview, and some of them also participated with letters to the editor. The newspaper discourse contributed to making our questions about knowledge creation with regional actors highly relevant.

My cooperation with the public relations manager ended with a presentation of our main findings in a meeting with the rector, the deans and the university college director in February 2005, and in June 2005 the rector also wanted a report from the project. The report is entitled: *Kunnskapsinteraksjon mellom HiA og Agderregionen* (Olsen and Karlsen 2005)²⁰. The findings from the interview will be presented in chapter eight. The findings are presented in qualitative terms, and not in quantitative measures, since we have only data from a limited sample of researchers at AUC. However, I regard the data as valid, since the interview subjects were key persons at AUC. They were selected because of their position within AUC as faculty director, dean or study programme coordinator. Most of the study programme coordinators were researchers who were working as a programme coordinator for a limited period. This implies that they had a good overview not only within their area of responsibility, which was at faculty or department level, but also with regard to the challenges a researcher faces at AUC.

After the interview round was finished, I had to re-think my decision about doing a survey. I had already used a lot of time in connection with the interviews, and I had obtained a lot of data. I knew that a survey would have given me more precise, measurable information about the different kinds of processes between AUC and the region, but not necessarily any new information. I was also sceptical about the possibility of getting enough answers; i.e. a high response rate. Since I had generated a lot of information with the public relation manager I therefore decide to skip the survey.

In addition to the above list of interviews, I have also participated as an observer in different meetings at AUC, such as information meetings for the staff in connection with the strategy

²⁰ The report is only in Norwegian. Translated to English the title is: *Knowledge interaction between Agder University College and the Agder region*.

plan process in 2004 and 2005, meetings in the research committee²¹, and meetings with staff in departments. I have gone through board papers and reports from different strategic processes. They will be listed when I use them in chapter nine.

6.5 Third data set – A study of two knowledge creation processes

This data set is generated from two knowledge creation processes between students and companies in the region. To structure the data in chapter nine I have used the model I created in chapter five: cf. the model for organizational design of knowledge creation processes.

As I said in the previous section I have more data than I have used in the study. In order to test some of the data against my main research question I wanted to find cases that could give data about knowledge creation processes, and present them in a trustworthy manner.²² One challenge is that the theory I have presented in the earlier chapters can be used to tell different stories about knowledge creation processes between university and industry. Another challenge is how data from a limited number of processes can be used in a more general form. One way of responding to the challenges is to sort the data and see if they fit as a maximum variation case. The purpose of a maximum variation case is to obtain information about cases that are different on one dimension, and similar on other dimensions (Flyvbjerg 2001). The concept “similar” does not mean that the other dimensions must be true copies. In reality there will always be differences. The question is how big a difference can be allowed before the data is not similar. There is no objective answer to this question. It is a matter of judgment, as Bell (1974) says: cf. the discussion in chapter two. I had to find some processes and judge whether they fitted my purpose. I will return later in the chapter with the account of how I found the processes, but first I will present some data from them. The data are from two courses where students meet companies in the Agder region. The courses are:

- Master’s thesis in Industrial Management, and
- FRAM-Gründerlab

The data from the two courses are similar on several dimensions such as the following:

²¹ The research committee consists of the research director and the deans.

²² The question is: how is knowledge created between AUC and industry?

- The courses are organized under the same university.
- The researcher responsible for the organization is from the same faculty (School of Management)
- The courses are organized by researchers with theoretical knowledge in economics, innovation, business management and entrepreneurship.
- The courses are organised as knowledge creation processes between students, advisors and companies in the Agder region.

On the other hand the companies are different. The companies that cooperated with the Master's students were ICT companies. The companies that participated in FRAM-Gründerlab were entrepreneurs, representing different kinds of industries. There were some ICT companies, and other kinds of companies, such as a catering company, an advertising firm and an accountancy firm. However, this difference is of minor interest when it comes to a knowledge creation process. My main interest is how they organize and participate in the knowledge creation process with the students. From this perspective the difference between the companies becomes a difference in degree, not in kind. (See the information box below for an explanation of the difference between kind and degree). This means that the difference between the companies is not an obstacle for the comparison of the courses.

Also the students are different. A Master's student has acquired more theoretical knowledge than a Bachelor's student, and has spent more time at university than a Bachelor's student has. Nevertheless, the Bachelor's students had at least two years of experience from university, which means they were not freshmen. However, the difference between the students is smaller than between the companies. I have therefore judged the difference between the students to be a difference in degree, and not in kind.

There is one difference in kind between the two courses, and that is the time available for knowledge creation. In FRAM-Gründerlab the available time for knowledge creation is very short. The Centre for Entrepreneurship uses a compression tank as a metaphor for the knowledge creation. The students and the companies are supposed to create knowledge together in very short, intense periods. The students meet the companies on the introduction day when they get information about the challenge the companies want them to solve; i.e. *what to do*. In that meeting they are also supposed to design the data generation for the next two gatherings, which are three and six weeks after the introduction day; i.e. *how to do* the

data generation. Each gathering lasts three days. On the last day of the last gathering the students deliver a report and make a presentation for a commission comprising the researcher from AUC and business people.

Information box 3: The difference between kind and degree

The challenge of sorting and categorising processes is a discussion of kind versus degree, which is the arbitrariness of taxonomy. When we categorise, which we do all the time either intentionally or unconsciously, we make hierarchies of types. A non-pragmatic approach will categorise types and sub-types according to an algorithmic means (Givón 1989). Individuals in a population with minor differences in properties will be classified as the same type because their differences are of a minor degree. Individuals with major differences in properties are said to be different in kind and they are therefore classified as a different type, i.e. in a different category. The distinction between “degree” and “kind” is the basis for taxonomies, whether they are pragmatic or not (Givón 1989). A non-pragmatic approach will categorise in absolute categories. Everybody who has tried to categorise has experienced that there are always some types that are difficult to place in one category, but the absoluteness of the boundaries between the categories gives no option. All have to be placed in the one category. The pragmatic answer to this situation is that the difference between minor and major properties, and thus between difference in kind and difference in degree, in principle is arbitrary; it cannot be made on either deductive or inductive judgements (Givón 1989: 7). It is a matter of judgement about the context, and the purpose of the taxonomy.

The work load of FRAM-Gründerlab is rated as 10 credits, which implies that the students also take other courses in addition, while the work load with the Master’s thesis is full time. The time available for the Master’s students is the spring semester, but they have had parts of the autumn semester to prepare for the work with the company. When the spring semester starts, the students *know what* they are going to do. This is codified as their thesis statement. Compared to the students in FRAM-Gründerlab the Master’s students have an advantage. The former students do not know what they are going to do before they have met the company on the introduction day, and since they do not have this information, they do not know how to

solve the challenge for the company. The main difference between the two courses is that the students in FRAM-Gründerlab have simultaneously to decide *what to do*, and *how to generate knowledge* with the companies.

Knowing how is the actions that create the knowledge that the students codify in their Master's thesis, cf. the discussion in chapter two. The knowledge I want to examine concerns how knowledge is created between the students and the representatives from the companies in the two courses. The question I want to discuss in chapter nine is in addition to the above stated questions:

- Is there a difference in the knowledge creation process between the Master's students in Industrial Management and the students in FRAM-Gründerlab?

If the students from the two courses create knowledge in the same way, despite the difference in the time dimension, and a *ceteris paribus* condition on all other organizational dimensions, then there is some taken for granted knowledge about how knowledge is created when university and industry meet each other in the agora. If they create knowledge differently, the answer has to be found in the specific and unique organizational design of the courses.

One such process was the Master's programme in Industrial Management, at the department with the same name. This is located in Grimstad together with the Faculty of Technology and Science, but is organizationally under Faculty of Economics and Social Sciences. In February 2005 I decided to have some interviews with researchers at the department, and also interview the programme director at the Department of ICT in the Faculty of Engineering and Science. I also followed two Master's students during the spring semester. The data I have generated from the Master's thesis is presented in the form of narratives and quotations from students, companies and researchers.

FRAM-Gründerlab started in September 2005 with an introduction day and two gatherings, each of three days in October and November. I participated in the course, and in two meetings between students and companies between the introduction day and the gatherings. Since I participated with the staff in FRAM-Gründerlab, I have another kind of data and a bigger amount of data from this process than from the process with the Master's students. I also wrote an evaluation from the course in January 2006 (Karlsen 2006). In the table below I have

listed up how I have generated data from the two courses. The table is so detailed that I do not describe the data generation process any further in the text.

Table 13: Data generated in the period from March 2005 to January 2006

Name of course	Master's thesis in Industrial Management	FRAM-Gründerlab
Data generation process		
Interviews with students	2 students were interviewed 3 times during spring 2005	
Interviews with companies	CEO and technical director in one ICT company and department leader in another ICT company in April and May. One follow-up interview with both companies in November 2005	
Interviews with researchers	2 researchers in April and follow-up interview with one later	
Focus group interviews with students	5 Master's students from the Department of Industrial Management and 1 from department of ICT in May	2 interviews with the students in plenary and 5 interviews done in working groups
Focus group interviews with companies		2 interviews with 12 companies in October and November
Meeting with project team		4 meetings before and after the gatherings with the whole and parts of the project team in the period from September till November.
Intervention in the form of a meeting with a researcher and a company	1 meeting with a researcher and a CEO in an ICT company in June 2005	
Meetings between students, companies and advisor		2 meetings in two companies in October.
Survey to students		43 questionnaires
Survey to companies		12 questionnaires
Master's theses	4	
Reports from students		9
Talk/dialogue with students and researchers	1 with the next cohort of Master's students in Industrial Management in November 2005	
Talk in a seminar with researchers, management and industry in Agder	1 where I presented some of my findings from the Master's course in Industrial Management in November 2005	
Report made by me from the process	Note to the researcher responsible for the Master's course in Industrial Management in June	Evaluation report to Innovation Norway in January 2006

7. A regional challenge for Agder University College?

My aim with the discussion in this chapter is to answer the following questions:

- a. *Why is Agder University College challenged by regional actors?*
- b. *Who is participating in the discourse?*
- c. *What kind of knowledge is created in the agora?*

The data I am using are mainly from a discourse in the regional newspaper *Fædrelandsvennen* from the end of October 2003 to the end of March 2005: chapter six. The structure of the chapter is as follows: First I introduce the participants in the discourse. Then I present the articles and comment briefly on them. Each article is presented with its heading in the newspaper. After that I will discuss the articles, before I draw a conclusion.

7.1 The participants in the newspaper discourse

The first two questions will be answered during the presentation of the newspaper coverage, while the other questions will be answered in the discussion after the presentation.

The new, emerging legitimacy of knowledge and university follows no geographical boundaries, but in meeting a regional context the discourse is changed by the actors that participate in the discourse. It is changed through the language the actors use. The actors participating in the discourse are:

1. Agder University College represented by the rector
2. Industry in the region represented by the management in the companies
3. The Competence Development Fund of Southern Norway.
4. *Fædrelandsvennen*, in the role as organizer of the discourse and facilitator of the process.

Fædrelandsvennen has several roles. The first is as a reporter, the traditional role. As a reporter the newspaper refers to meetings and interviews with people that participated in the meetings. The second role is as a facilitator of discussions between different actors. The third

role is as a commentator on the regional discourse. I will focus on the first two roles, even though the editor of *Fædrelandsvennen*, with his sharp leaders, triggered a lot of responses from staff in Agder University College. I will focus on the rector of Agder University College, how he expresses himself in the discourse, and how the different regional actors talk about knowledge and the regional role of Agder University College.²³

Agder University College has been supported by the Agder region in its efforts to become a university. One example is the establishment of *The Competence Development Fund of Southern Norway (Competence Foundation)* in 2000 by the municipalities in Vest-Agder County.²⁴ The municipalities donated shares from the newly merged power company Agder Energi AS to the Competence Foundation, which later sold the shareholding. In 2005, the Competence Foundation had assets of approximately NOK 700 million. Competence is defined by the foundation as the ability to establish and utilize knowledge for practical purposes. The aims of the foundation are to help raise the level of competence in Vest-Agder County in order to secure and create employment and good living conditions, and contribute to the transition of Agder University College to a university.

The increased support from the region has contributed to more focus on AUC's process of becoming a university, and as a consequence increased expectations for the college. It was therefore a big disappointment among many of the actors in the region that Agder University College did not manage to move at the same speed in the university process as Rogaland University College, which was approved as the University of Stavanger in 2005. The regional newspaper has been critical about how the university process had been handled by the rector and the administration of the college. It must be added that the editor of the newspaper is a former rector of the college.

I will start the discussion at the point when the region and regional college are introduced to the Bologna process through a Green Paper from the Ministry of Education, and follow the discourse until it almost fades away in February 2005. I use the headlines from the newspaper articles as headings for the presentation of the articles. The newspaper articles are shown in the table with their headlines and date.

²³ One weakness of using a newspaper is that the reports about the different actors do not necessarily contain what they actually said. They probably said more than the journalist uses in the article. Another weakness is that the newspaper writes about a topic they want to present from a certain angle.

²⁴ All information is from the WEB page of the Competence Foundation.

Table 14: Reports in *Fædrelandsvennen*

Headline	Date
Will not be commercial	10/28/2003
Dislikes AUC's fear of industry	07/01/2004
Wants a useful university for industry	10/06/2004
Should be located in Kristiansand	10/26/2004
Peanuts from industry	01/17/2005
AUC strategy: Breakthrough for industry	02/24/2005

7.2 Will not be commercial

The above headline is from an interview with the rector and a student representative on the board of Agder University College, in connection with the discussion of a proposal from the Ministry of Education. The proposal deals with changes in the current legislation for universities and university colleges. The proposal is an element in the change process for Norwegian universities. The proposal the board is going to discuss is the Ryssdal Commission report, named after the leader of the commission.

After the headline in the article we can read that two interviewed board members dissociate themselves from the perspective that the market shall control the universities and colleges. They dislike the proposal from the Ministry of Education.

“We fear that the college will lose its free position and both research and subjects offered to the students will be ruled by money. And we fear that the students are going to have to pay for their education. It must not be the wallet that decides whether people shall get the opportunity to study”, says Charlotte Antonsen, leader of the student organisation in Agder ... “ Our aim is to develop socially aware, critical members of society. We are cultural institutions that operate in a market, but we cannot be compared with a hot dog factory,” says Jahr²⁵ (*Fædrelandsvennen* 10/28/2003).

Both board members express a fear for a future situation where the market rules in the universities. The student representative is concerned about free education in Norway. The rector argues for a continuation of a protected position for university as a cultural institution

²⁵ Rector of Agder University College.

in society, and that university cannot be compared with an enterprise. The arguments are possible to trace back to Kant's and Humboldt's ideas about university. As ideas they are old and well known: cf. the presentation in chapter three. In the meeting between Kant's and Humboldt's ideas and "new ideas" from the ministry, the board of Agder University College rejected the proposal, as many other boards of university and university colleges also did. Due to the strong resistance the ministry changed the proposal. The "old" discourse from Kant and Humboldt won the first round in the regional battle, but new challenges are coming up.

7.3 Dislikes Agder University College's fear of industry

One of the board members at that time in AUC was the regional director in NHO.²⁶ She is interviewed by *Fædrelandsvennen* after the meeting in the board. She regrets that she was the only member of the board that supported the proposal about an external majority on the board of universities and colleges. Today's situation is that the majority of the board are employees in the college. She argues that AUC must let industry onto the board and not be so self-preoccupied.

Many see Agder University College as an institution that is more concerned about itself and its academic freedom than developing interaction with the region... When the rector ... says to *Fædrelandsvennen* that AUC must not be a hot dog factory producing for a market, it demonstrates a fear of the market that's completely wrong seen in relation to the role higher education is supposed to have. ... Agder University College is operating in a market today, and is supposed to do that. ... Agder University College's task is to supply the market with the labour force it requires. Colleges and universities are supposed to encourage industry's competitive force. It is important to develop education and research that match the needs in the region. And it is important that business and the rest of society are involved in what is happening in Agder University College... The challenge for Agder University College is to keep up and communicate to the outside world how the college wants to contribute to the region, as the legislation for universities says it should do," she says (*Fædrelandsvennen* 01/07/2004).

The previous article in *Fædrelandsvennen* did not say anything about the concrete content of the Ryssdal Commission report. In the interview with the NHO director, some of the content in the report is presented. One of the suggestions was to change the majority of the board members in Norwegian universities from an internal to an external majority. Her defeat in the voting is described as a defeat for the region, for industry in the region and for the market.

²⁶ NHO is the abbreviation for the Confederation of Norwegian Business and Industry.

She connects the aim of Agder University College to serving the needs in the Agder region and to securing competitiveness for the regional industry in a global market economy, and not being enough in itself.

The NHO director's line of argument represents the new way of talking about universities. With the newspaper interview the new legitimacy of university has entered the agora in Agder. The director also indirectly hints that AUC has not contributed earlier to regional development. Her argument is connected to the kind of knowledge that proves itself in action and contributes to increased competitiveness for industry in the region. She does not use the word usefulness, but it lies between the lines, and in the next article it enters the agora.

7.4 Wants a university that is useful for industry

The next article is an interview with managing director Stalsberg at General Electric Health Care, and rector Jahr.²⁷ The managing director is also a member of the board of the Competence Foundation. In the article it is said that he would like to see a strategy for how Agder University College can be useful for industry:

Stalsberg says that the heavy industries in Sørlandet today, such as the process industry (Elkem, Falconbridge), the maritime industry and the ICT industry in practice do not have any external research milieus that support them (Fædrelandsvennen 10/06/2004).

Stalsberg brings in the “useful” argument and connects it to the needs of heavy industry in the region. He wants a university that can do research and development projects for them. He argues that in other regions in Europe it is usual to have cooperation between industry and regional university, where universities contribute professors to industry.

The rector admits that Agder University College can do better in the fields that Stalsberg is concerned about. AUC will discuss it in the strategy plan process for the college, which recently has started and will be finished in June 2005. He also adds that there is no possibility of fulfilling all Stalsberg's wishes in the forthcoming strategy plan.

²⁷ GE Health Care is a process company in the region owned by General Electric.

7.5 Should be gathered in Kristiansand

This headline is based on a proposal from a committee in AUC where the rector is the chairman. The committee's work is a part of the strategy plan process in the college. One of the proposals from the committee is to relocate the whole college to the campus in Kristiansand, which implies that the facilities AUC has in Grimstad and Arendal will be closed down. An alternative suggestion for two campuses is also presented: A main campus in Kristiansand and a smaller campus in Grimstad based on the Faculty of Engineering and Science. The argument for the single campus alternative is that this will make the college more attractive for students, and create a more diversified milieu in the college. By suggesting a two campus alternative AUC prepared the ground for a traditional location conflict between the two neighbour municipalities of Grimstad and Arendal. Both municipalities presented very attractive locations for the new campus.²⁸

Later in the article we can read that the committee argues that AUC must be useful for its host community.

Useful for industry, useful in the region, and useful in general (Fædrelandsvennen 10/26/2004).

AUC seems to have adopted the usefulness concept. The implication of the argument is that some study programmes may be closed down and others may be established. The committee underlines strongly that the future Agder University shall not:

become a vocational university with a main emphasis on experience based knowledge. ... Agder University shall be based on the same academic ideals as other universities. Agder University shall not be known as an alternative university based on another knowledge foundation (Fædrelandsvennen 10/26/2004).

The formulation presented in the newspaper is a very general one and becomes unclear as a result of the sentence: *based on the same academic ideals as other universities*. What "other universities" means is not specified in the article. One interpretation is that the committee means the Humboltian ideals presented in chapter four since they so strongly argue against experience based knowledge in favour of academic knowledge. It means that the committee has a vision of a Mode-1 university based on disciplinary knowledge. The committee seems to dissociate themselves from a Mode-2 university. They want a useful university, but based on

²⁸ The board in AUC decided in 2006 to build a new campus in Grimstad.

disciplinary knowledge. The article does not say anything about how they are going to develop a useful university in combination with a strategy for a traditional university.

Later in the article we can read why AUC must become useful.

Agder University must get money from other sources (Fædrelandsvennen 10/26/2004).

The committee acknowledges that the state will not contribute more money. This is what Lantz and Totterdill (2004) called a third stream income for university. In a future situation with reduced yearly growth in the budget financed by the government the industry and the Competence Foundation represent a new stream of income for Agder University College. So far the industry in the region has contributed with little money to AUC, which is the topic for the next article I will present.

7.6 Peanuts from industry

Rector Ernst Håkon Jahr at AUC and chairman of the board of the Competence Foundation Magne Dåstøl are participants in the meeting facilitated by *Fædrelandsvennen* in January 2005.²⁹ According to the newspaper article industry in Stavanger, a city in a neighbouring region, has given approximately NOK 100 million to the work with the plans for a university, while companies in Agder have only contributed about NOK 3 million to Agder University College's efforts to become a university.

The limited contribution from industry in Agder is probably due to the fact that industry has not seen the usefulness of a university. However, I believe that there are possibilities for getting money from industry for new programmes at the university, says the chairman of the board of the Competence Foundation (Fædrelandsvennen 1/17/2005).

The chairman of the Competence Foundation is clear in his message. Industry has not seen the usefulness of AUC. He follows up the NHO director's comments about Agder University College and also refers to what the director of General Electric said. Rector Jahr, on the other hand, says that:

It must be a paradox for industry that it is the municipalities in the region, through the establishment of the Competence Foundation, that have led us to the point we are at today. It is a pity that parts of industry so far only have considered their own interests and not the usefulness for the region of a

²⁹ The chairman is also a director in Elkem, a process company that is owned by Elkem Industrial Enterprise.

university. ... We have been given NOK 40 million for the work with the university, NOK 37 million of which is from the Competence Foundation and the rest from industry (Fædrelandsvennen 1/17/2005).

The rector tries to change the discourse, by arguing about the usefulness for the region of having a university, and that it is the municipalities that have contributed to the establishment of the Competence Foundation. Industry in Agder has not been as generous as in Stavanger.

In the interview the rector talks about the usefulness of a university for the region, and comments that industry has not contributed much money to the university. By doing this he changes position in the discourse. He is no longer talking about knowledge as an end in itself, as in the first article I presented, but about knowledge as a means to an end. He uses the fact that Agder University College is located in the region as an argument for economic support from industry.

We can also read that the journalist in the article confronts the rector with his comment that AUC is not a hot dog factory. "Is that not a patronizing attitude towards industry?" he asks. The rector replies that it was not meant to be so:

My point was that we do not produce commodities for a market in the same way as a company does. We are different from a traditional factory (Fædrelandsvennen 1/17/2005).

The chairman of the Competence Foundation replies:

But such a statement gives an impression of a patronizing attitude towards industry. And I often hear companies say they will not pay because they do not feel that they get something in return (Fædrelandsvennen 1/17/2005).

Then the journalist asks Dåstøl what industry wants and he says:

Today there is too little interaction between Agder University College and industry. The research at AU must be directed towards areas that already are or will be of significance in the region: the process industry, offshore/drilling technology, ICT, and the adventure industry. ... A university cannot be good in everything. It must focus. ... And if Agder University College says that they are willing to go in that direction, I think industry is willingly to pay (Fædrelandsvennen 1/17/2005).

The interview is rounded off with a statement from the rector:

We will get closer to industry and not be an ivory tower (Fædrelandsvennen 1/17/2005).

The newspaper article repeats some of the main arguments from the debate in 2004, such as the hot dog factory and the usefulness argument. The journalist tries to push both the rector and the chairman to specify their arguments. The chairman does so by listing four specific industries. He clearly wants AUC to focus on these and, if they do, industry will be willing to pay. The rector does not specify his arguments, but apologises for his statement about the hot dog factory, and he is beginning to change his opinion when he says:

we will get closer to industry and not be an ivory tower (Fædrelandsvennen 01/17/2005).

7.7 AUC Strategy: Breakthrough for industry

This article is from a board meeting in AUC where the board discussed elements of the new strategic plan for AUC. After the introduction, the article cites the NHO director:

Now I am optimistic. We are in a new and constructive phase (Fædrelandsvennen 2/24/2005).

Later in the article we can read that one of the board members, a professor from AUC, states that AUC has an obvious need to be relevant for industry. But he also wants industry to be more concrete in their specifications about their needs. According to the newspaper the NHO director replied that this was not a problem. She had had a secret meeting with eleven of the biggest companies in Agder the evening before.

We believe AUC must focus on the process industry, drilling, energy, the maritime industry and ICT. In addition there must be a change in the attitude of many of those employed at the university college (Fædrelandsvennen 2/24/2005).

The NHO director wants a more technological profile for AUC, and she wants to change the attitude of some of the employees. Later in the article we can read that also the other board members wanted to make AUC more relevant for industry, and that the rector was optimistic about the possibilities of reaching an agreement with industry about future areas of cooperation.

It is evident that the discourse in *Fædrelandsvennen* has resulted in more focus on demonstrating that AUC wants to interact with industry and to be useful. The discourse changed the college's attitude, at least for some time. The effect of the change was possible to

trace after the most intense part of the discourse; i.e. from February and towards summer 2005. For instance, in one of the articles we can read about an associate professor who wants to be involved with industry.³⁰ She had recently completed her doctorate in optimization of production processes. From the article we understand that her work is purely theoretical, but she wants to make the theory applicable for industrial purposes. After this article the discourse fades out, and the time has come to analyse the discourse in greater depth.

7.8 The legitimacy of the challenge

The limited space for a discourse in a newspaper contributes to making the various participants' position and connection in the discourse very clear. However, the limited space does not contribute to making the discourse especially thorough. The discourse remains fairly shallow and abstract. The actors are not much challenged by the newspaper, for example by asking what the actors mean by *useful for the region or for the industry*, or what the rector means by *the same academic ideals as other universities*? The most concrete aspect in the discourse is the list of industries, which is introduced half way in the discourse.

The newspaper discourse gives no indication of how the change in the discourse can be connected to changes in practice in Agder University College. The last coverage gives an indication that the list of industries will be integrated into the strategy plan the board is going to discuss in spring 2005, but it does not say anything more about how Agder University College and the future Agder University can be useful for industry, and how a traditionally disciplinary academic community can be useful.

In the first article, *Will not be commercial*, the rector made a reference to the old legitimacy of knowledge and university; i.e. knowledge as an end in itself. The old legitimacy is based on a dual relationship between the state and university, where university has the freedom to choose whether it wants to cooperate with industry. The discourse changes the moment Stalsberg, the member of the board of the Competence Foundation, entered the discourse. His entry changes the relationship to a kind of a Triple Helix relationship. He represents the Competence Foundation which has money, and he represents industry. His entry establishes also the usefulness legitimacy in the discourse.

³⁰ Article in *Fædrelandsvennen* 4/20/2005.

Stalsberg introduces the new legitimacy of university in the discourse by talking about the usefulness of AUC for industry. The rector argues about the usefulness for the region. However, he does not clarify what he means by usefulness for the region, but Stalsberg specifies what he means by usefulness. He lists which kinds of industry AUC should be useful for. The specification of industries follows the rest of the discourse, with some minor changes, which I will comment on in a moment.

The participants also indirectly hint that so far Agder University College has not been useful for industry, and that usefulness for industry seems to imply usefulness for the region. The underlying message in the discourse from industry and the Competence Foundation can be summarised in one sentence: *If Agder University College can be useful for industry, they will get money.* The rector seems to acknowledge that Agder University College, like other colleges and universities, must get more money in the future from sources other than the state, such as the Competence Foundation.³¹

Information box 4: Budget for AUC, external financing and financing from the Competence Foundation

The total budget for AUC was in 2004 NOK 713 million and the external financing from other sources was about NOK 50 million, which is about 7 percent of the total budget. The money from the Competence Foundation to AUC was the same year NOK 17 million, which is 2.3 % of the total budget for AUC that year. For the period 2001 – 2006 the Competence Foundation has given about NOK 80 million to AUC. About NOK 50 million has been given to AUC work with the transition from a university college to a university. The other NOK 30 million has been given to other project in the university college.

Sources:

- the Competence Foundation
- NSD-stat

The information in the above box above indicates that the money from the Competence Foundation is marginal, seen in relation to the total budget for AUC. However, it is still important because it can be used for other purposes than the ordinary money can. It gives the

³¹ About 88 % of the total budget was financed by the state in 2003, according to information in *Fædrelandsvennen* 10/26/04.

institution increased degrees of freedom, such as to initiative actions to become a university. The ordinary money from the state is not meant to be used for such a purpose.

The Triple Helix relationship connects AUC more closely to the needs that the Competence Foundation defines as important. The list specified by the NHO director is identical with the areas of focus from the Competence Foundation, with the exception of energy and creative industries: cf. the table below.

Table 15: Comparison of the wish-list from industry with the focus area of the Competence Foundation

The list of industries from the NHO director	The focus areas of the Competence Foundation³²
1. Process industry	1. Process industry with a main focus on material technology
2. Drilling	2. Maritime industries/mechatronics
3. Maritime industry	3. ICT/broadband
4. ICT	4. Creative industries
5. Energy	

The argument in favour of these areas of focus from the Competence Foundation is:

deeply rooted in economic theory, particularly in the so-called "cluster theory". Both for knowledge-based environments and for lines of business or clusters of industry, it is important to achieve a critical mass in order to be competitive now and in the future (Areas of focus, WEB page of the Competence Foundation).

The idea or theory behind the discourse seems to be Porter’s regional cluster theory. The cluster theory argues for specialisation of industries where the region has comparative advantages. One consequence of the cluster theory is that the theory favours somebody at the expense of somebody else. In relation to the discourse, *somebody else* means, for example, entrepreneurs and newly-established industry, and industry not established yet; i.e. tomorrow’s industry. It means small and medium-sized companies of different kinds outside the cluster industries.

³² The information about the Competence Foundation is from their WEB page. <http://www.kompetansefond.com>. The areas of focus were adopted in June 2003.

The discourse also excluded other kinds of challenge the region faces. For instance, the region has a lower share of women in work than other regions in Norway and a much higher share of women in part-time work than any other region in Norway (Magnussen, Mydland Stalsberg, and Kvåle 2005). It is especially younger women, i.e. women of child-bearing age, that have a weaker connection to working life than women in other regions in Norway. In general women are under-represented in managerial positions in industry, in local politics and in other positions in the region (Magnussen *et al.* 2005).

The Competence Foundation's area of function is limited to Vest-Agder County; i.e. one half of the Agder region, while AUC is a college for both Aust- and Vest-Agder counties. This limits the geographical space for the discourse. Another limitation is that the discourse in the newspaper is limited to those who read the newspaper. Who has read the discourse it is not possible to detect, but there are good data about the circle of readers of Norwegian newspapers. These data show that the circle of readers of *Fædrelandsvennen* is largest in Kristiansand, where the newspaper is located, and the neighbouring municipalities. The numbers of readers decreases sharply not far into the eastern part of the region and towards the border municipalities in the western part (Fosse, Karlsen, Magnussen, and Cruickshank 2003). This implies that the potential readers of the discourse are limited to the Kristiansand region.

A first interpretation of the discourse seems to imply that a useful university for industry is the same as a useful university for the region, but that is not true. The discourse is more a cluster theory discourse than a regional discourse, judging by the basic idea behind the discourse, the limited occurrence of other topics in the discourse and the limited diffusion of the discourse in the Agder region. The discourse in the newspaper can therefore hardly be regarded as a discourse for the whole Agder region. It is more a discourse for the Kristiansand region, which is the main city in the Agder region. Even though the discourse is limited to this area, it can still be a discourse that is important for industry in the region. I will look more closely at the theory behind the argument for a useful university for specific industries.

7.9 Clusters in Agder?

Porter's cluster theory has inspired policy-makers both on the national and on the regional level to do cluster analyses and to implement cluster strategies. One such study is Reve and Jakobsen (2001). They identified six national clusters in Norway: seafood, energy, maritime industries, ICT, trade and the financial services industry. The similarity with the regional lists in Agder is evident. The process industry is not on the national list, but energy, maritime industries and ICT are. However, this does not imply that these industries constitute a regional cluster in Agder. They can be part of a national cluster, without being a regional cluster.³³

A statistical study done by Nås (2000) identified 63 regional clusters in Norway, but only one in Agder. The regional cluster was in the ICT industry, and its regional demarcation was in the eastern part of the Agder region, in the Arendal – Grimstad area. A later study done by Isaksen (2003) confirmed that this is a regional cluster. The study demonstrated that the companies that constituted the regional cluster cooperated with each other, they had demanding customers in the region and they competed with each other. The cluster was also characterised as a dynamic cluster because of a high rate of innovation over the last three years. Isaksen also found that the ICT cluster also included companies in Kristiansand. This implies that the cluster covers the area from Arendal, via Grimstad to Kristiansand. The cluster is located along the central coastline and the most populated area of Agder.

Isaksen (2003) also commented on the cooperation between Agder University College and the companies in the cluster:

The cooperation between companies and R&D institutions in Southern Norway is surprisingly wide. R&D institutions include regional colleges, including Agder University College in this connection. The extent of the cooperation between companies and R&D institutions in Southern Norway shows that the knowledge produced by the research in Southern Norway is relevant for the companies. This contact contributes to knowledge being well spread (Isaksen 2003: 11).

Contrasted with the newspaper discourse that indicated that AUC was not useful for industry Isaksen's data show the opposite. The ICT companies that have participated in the study say that AUC is useful for them. The argument from industry is not confirmed in the meeting with the ICT cluster.

³³ See the discussion in chapter four about the difference between a national and a regional cluster.

One weakness with Isaksen's (2003) study was a low participation. Only 43 % answered the questionnaire. He therefore says that little participation can lead to distortions in the data. However, he does not discuss this further. One distortion in the data could be that the companies that responded are the dynamic companies in the cluster, which therefore have a lot of cooperation with each other and with AUC. Even if there is some kind of obliquity in the material, Isaksen's study confirms Nås' (2000) identification of a regional ICT cluster. It also demonstrates that the cluster is dynamic, and that there is cooperation with AUC.

What about the other clusters the Competence Foundation and the industry talks about, such as the maritime and the energy clusters? Only one in-depth regional cluster study has been done in Agder, and that is Karlsen, Isaksen, and Hauge (2001) study of the maritime cluster. The study was done in cooperation with a nation cluster analysis of the maritime industry (Hervik and Jacobsen 2001). The study demonstrated that the maritime industry was an important industry in the Agder region, measured by sale and trade, value creation and employment. The trade was about NOK 10 billion and the industry employed about 6400 people. However, the study also demonstrated that, when evaluated by cluster criteria, the cluster was weak (Karlsen *et al.* 2001). The cluster was a part of a national cluster. In the Agder region the number of demanding customers was low, while national and international customers were much more demanding. There is also little regional competition. However, competition was much stronger from national and international companies.

The companies in Agder also had little cooperation with other maritime companies in the Agder region, and cooperated more with national and international companies. Compared to nine other regional maritime clusters in Norway the maritime cluster in Agder was rated as the one with the lowest share of innovation and knowledge creation (Hervik and Jacobsen 2001). Compared to the ICT cluster the cooperation with Agder University College was low. The companies in the maritime cluster cooperated more with national and international universities and research institutes. This is characteristic for companies that are a part of a national cluster. They prefer to cooperate with other companies, customers and R&D institutions that can offer cutting-edge knowledge. Regional actors, such as universities, that cannot offer this kind of knowledge are not of interest or relevance when it comes to cooperating, for this kind of company (Levin 2007).

The discussion demonstrates that, with the exception of the ICT cluster, there is little evidence for dynamic regional clusters in Agder. The existence of strong companies, such as Elkem, Falconbrigde, GE Health Care and Agder Energi, is not the same as the existence of a regional cluster. There are many companies in the region that belong to national clusters, but that is not enough to satisfy the criteria of a dynamic regional cluster. The companies are lonesome, local heroes. However, a lack of clusters is not necessarily a weakness for a region. Strong companies that are competing nationally and globally can be an advantage for a region, because the region becomes less vulnerable to structural changes in a cluster. Such companies can also inspire other companies to work harder, and they can inspire people with business ideas to establish themselves.

The weakness with the cluster discourse in *Fædrelandsvennen* is that the participants from the Competence Foundation seem to take the existence of clusters in the region for granted. The only regional clusters we know about are the ICT cluster, in the southern part of the region, and a weak maritime cluster. No newer cluster studies have apparently been done in the region. There is no theoretical knowledge about the existence of other clusters. Since there has not been any cluster analysis done, there is no knowledge about possible weak and strong cluster mechanisms. This lack of knowledge makes it difficult to make strategies for upgrading the weak part of the cluster(s), and it makes it hard to know what kind of knowledge AUC can contribute with. One way of acquiring more knowledge about this point is simply to do a cluster study. The outcome of the study can be used to discuss what AUC can possibly contribute with regard to knowledge.

The question mark in the heading of this discussion is intended to indicate a doubt about the cluster discourse. The discussion in the newspaper has been more a company-oriented discourse, than a cluster discourse. It has not talked about upgrading cluster mechanisms. The discourse in the newspaper has been dominated by an approach towards technology, and no other kind of theoretical knowledge.

7.10 Discussion

At the beginning of the chapter I formulated the following questions:

- a. Why is Agder University College challenged by regional actors?*
- b. Who is participating in the discourse?*
- c. What kind of knowledge is created in the agora?*

The usefulness legitimacy has reached the Agder region and in the meeting with the regional context the legitimacy is concretised and made more specific. The regional actors, (the Competence Foundation, representatives from the process industry, and NHO), want Agder University College to participate more in the region. They want a university college that can be useful for industry. The specific conditions in the Agder region are firstly the creation of the Competence Foundation by the municipalities in Vest-Agder, which presented the possibility of developing a powerful relationship between industry and policy makers, such as the Competence Foundation, in the region.

A second condition is the plan for changing Agder University College into a university. However, in order to fulfil the vision the college needs regional support. Even though the money from the Competence Foundation is marginal, it matters. In the discussion in this study I have mainly focused on money as one important kind of support. But there are other kinds of support too, such as goodwill and symbolic support. These kinds of support were regarded as important when the board decided to choose a two campus structure, with campuses in Kristiansand and Grimstad, and not a one campus structure. Only one campus in Kristiansand would have triggered a strong reaction from the municipalities in Aust-Agder County. The choice of a two campus structure avoided such a reaction.

The need for regional support may be one reason for the rector's position in the discourse. The rector started out as very clear and strong in the discourse in the first newspaper coverage, but has become more and more unclear later in the discourse. The rector corrects his opinion more in line with the other actors' opinion during the discourse. He does not bring in new arguments that can change the discourse, and neither does he question the arguments from the other regional actors. Neither does the regional newspaper question the arguments in the discourse. They all take it for granted that the representative from industry and from the

Competence Foundation knows best the problems and challenges for the Agder region and for industry. However, as I have shown there are a lot of voices that have not participated in the discourse, such as SMBs, entrepreneurs, women, and actors outside the Kristiansand area. In fact, the discourse has been dominated by a small group of actors.

The newspaper discourse contained several aspects. The first is the principal question about cooperation in the agora between a regional university and industry. This is a principal discussion because it is a change from the Humboldtian legitimacy to the usefulness legitimacy. It is a general discussion, which is necessary to have in every region and in every regional university when university is challenged. Also in the Agder region it was necessary. The rector changed his position from a Humboldtian legitimacy towards the usefulness legitimacy. At least in the discourse there seems to be agreement that AUC must cooperate with industry.

If the first aspect was a principal one, the second aspect is complex and contains the two main questions from the cogenerative action research model (Greenwood and Levin 1998). The questions are: what is the aim of the process? and how are we going to implement it? The regional actors' argument is that AUC shall cooperate with specific industries, called regional clusters: cf. the list specified by the NHO director and by the Competence Foundation. The discourse was only about the aim of the cooperation, and not how the actors are going to cooperate in practice. I will therefore concentrate on the first question from Greenwood and Levin (1998).

My argument is that there is a lack of theoretical knowledge about the existence of other regional clusters than the ICT cluster and the maritime cluster. There is a lack of theoretical knowledge about the possible weak cluster mechanisms of the other clusters, and there is a lack of studies of what kind of knowledge Agder University College can contribute.

The newspaper discourse is an example of single loop learning, which occurs when knowledge is taken for granted (Argyris and Schön 1996). From an acknowledgement that Agder University College has participated little with industry, and the fact that knowledge in the "knowledge society" discourse is said to be more important than ever, the regional actors argue that the university college must participate more with industry. The problem with single loop learning is that the basic problem that caused the problem is not necessarily solved. In

the newspaper discourse no one knows what the problem is. If you do not know what the problem is, how can you take any action?

In order to proceed from a single loop to a double loop learning process the actors must question each other's assumptions and taken for granted knowledge (Argyris and Schön 1996). It does not imply a process where some actors from industry say that this is the problem. The regional role of university is too complex and too important a discussion to be decided only by specific actors, such as industry, or the university. It is a challenge that needs a thoroughly democratic dialogue (Gustavsen 1992) with all kinds of industry, with the Competence Foundation and other financial actors, with municipalities and counties, with social groups etc. in the region. In order to have such a dialogue it is necessary to do some studies of challenges in the region. A starting point could be to do cluster studies or a regional innovation systems study, where the weak and strong sides of industries, clusters and the innovation systems in Agder are explored. When one has this kind of knowledge, one can discuss more precisely if AUC has knowledge that can match the needs of industry.

The university college must mobilise its knowledge potential in the dialogue. It is not the rector's individual knowledge that is relevant in the discourse, but the collective research based knowledge the university has. A regional role for the university college implies that the university college participates with the knowledge that is relevant in the discourse. The reproduction of taken for granted knowledge is not necessarily useful knowledge for industry, or for the region or for the university college.

The challenge of university, which I presented in chapter three, was a challenge from a new mode of knowledge creation, called Mode-2, which is disciplinary knowledge created in a context of application. The discourse in the Agder region has been more characterized by disciplinary knowledge than transdisciplinary knowledge. This implies that only a part of the new legitimacy of university has been discussed in the region. The disciplinary knowledge is probably a result of the participants' knowledge, which is technology and disciplinary oriented. They do not necessarily see the need for transdisciplinary knowledge.

8. Organization of processes in the agora

In this chapter I will focus on how knowledge creation processes are organized in AUC. My aims with the discussion in this chapter are to answer the following questions:

- a. *How are knowledge creation processes with regional actors organized at Agder University College?*
- b. *Who is participating in the processes from AUC?*

The mapping of processes is based on qualitative interviews and document studies, cf. chapter six. I will first present how the processes are organized in AUC. These findings are sorted and presented under the following headings:

- Strategically organized processes
- Management organized processes
- Collectively researcher organized processes
- Individually researcher organized processes

Then I will look more closely at the location pattern of the companies that cooperate with AUC. I will end the chapter with a discussion of the organizational design of the processes and the knowledge involved in the processes.

8.1 Strategically organised processes

Long-term strategically organized processes are processes that have been approved by the board in Agder University College. The university college director is the officer in charge of the matters that the board has approved. The board or the university director, after delegation from the board, decides the aims and the mandate for the process in question and selects the leader and the participants for it. The outcome of these kinds of processes is codified, for example in a plan or a report, and discussed in the board after a recommendation from the university college director. The discussion in the board decides the next step in the process.

There are two main paths that I will present in the following. The first is processes initiated by the board and the second is organizational changes decided by the board. I will start with presenting relevant processes initiated by the board in 2004 and follow them through towards the end of 2006, so that changes and the outcome of the processes are possible to identify.

The strategy plan for AUC is one example of this kind of process, which I will call the *Strategy Plan* in the following (HiA 2005b).³⁴ The rector chaired the committee that was responsible for the process and the final document that was presented to the board. There were also regional actors participating in the process. A part of this process was presented in the regional newspaper discourse in the previous chapter. The process was organized by means of a discussion document that was distributed for comments both in the region and in Agder University College. In AUC information meetings were held where the rector and others from the committee presented the main substance in the discussion document.³⁵ The plan process was top-down organized and managed with little involvement of researchers, students and staff in general.

The effects from the newspaper discourse, presented in the previous chapter, are possible to trace several places in the Strategic Plan. One formulation from the plan is that AUC has a responsibility to distribute knowledge and results from research projects to the Agder region. Another formulation is that AUC will contribute to value creation processes in the region. The new legitimacy of university which emphasizes transdisciplinary knowledge is also possible to trace in the plan, even though the concept is not used in it. The plan states that coordination and cooperation between different subjects in Agder University College and professions within the college are important to develop because this will demonstrate that AUC can offer knowledge within many areas. The disciplinary approach is most distinct in the section of the plan that is organized with five strategic themes. The *five strategic themes* are: learning and knowledge development; industrial development and innovation; welfare, democratic society; art and culture; and the global and the multicultural society.

The theme of most relevance for regional industry is *Industrial Development and Innovation*. The formulation is so general that this can be interpreted in different ways. One interpretation

³⁴ The plan was approved by the board in AUC in June 2005.

³⁵ In a general meeting in Kristiansand 12/01/2004 nearly 60 people turned up. The majority were researchers. After the opening speeches the floor was opened for questions, inputs and suggestions from those attending.

is that this is an attempt to re-interpret the disciplinary newspaper discourse towards a more transdisciplinary approach, but it can also be interpreted as a direct follow-up of the newspaper discourse. Even though the formulations are very general in character they have some strategic consequences, such as the integration of innovation and entrepreneurship in different study programmes. The plan also states that AUC cannot offer knowledge that covers all kinds of needs in industry, but that AUC will develop knowledge within some specific themes of main relevance for industry.

The Strategy Plan has so far been followed up with two processes. One aimed to concretize the five strategic themes in the plan. The process is called the *Thematic Process* in the following (HiA 2006a). With the exception of the director of Agder Research both the leader of the process and the other participants were researchers from AUC. There seem to have been a lot of discussions about the interpretation of the different themes. The complexity of discussing transdisciplinary knowledge creation is possible to trace both in the process and in the final report. The committee had eight meetings before they delivered the report and took more time than expected. In the letter from the secretary for the process to the university college director he underlines that the report was created without dissent, which is an indication of a process with much discussion and may be some disagreement.

The outcome of the process was related to internal affairs in AUC and did not discuss AUC's role in the region in any depth. In the report Agder Research is given a mediating role between AUC and the region. This seems to imply that the committee is of the opinion that Agder Research should take part of the responsibility for Agder University College's regional role, but the report does not discuss further how Agder Research can perform such a role. A solution where Agder Research is given the regional role of Agder University College would be to separate it from research and education in college. This solution would institutionalize the regional role in another organization than university, which implies that researcher in university can continue to create knowledge in a disciplinary mode. It would not change the mode of knowledge creation in the college. I will return to this question in chapter ten.

Even though the mandate of the report is transdisciplinary the different disciplinary approaches are possible to trace in the report. Each of the five themes is structured with a presentation of the different disciplinary approaches within each theme. For instance, the theme *Industrial Development and Innovation*, is discussed both from an actor's and

entrepreneurial approach, and from an innovation system approach. The RIS approach offers a transdisciplinary systemic perspective of innovation, while the classical perspective of innovation is actor- and discipline-oriented. It is the former perspective which is presented further in the report as an example of an area where AUC can contribute with knowledge to regional industry. The report lists industries, such as the ICT industry, and the oil and gas industry. The demand for disciplinary knowledge from regional industry is connected with the disciplinary knowledge in Agder University College.

The other follow-up project of the Strategic Plan was an organizational process, called the *Organizational Process*, in the following (HiA 2006b). The process was managed by a former rector at AUC with one participant from AUC, one from industry in the region and a former researcher at AUC, living outside the region. Also this committee concentrated mainly on internal affairs in AUC. Among the proposals from the committee were a merger of the Faculty of Technology and Engineering and the Faculty of Science, changes in teacher education, and a new structure for departments within each of the faculties. A topic that was discussed by the committee, but which was said to be too comprehensive, was AUC's relationship to regional actors. They therefore postponed this topic, but recommended that it should be followed up with a new process. The board followed this advice and at the end of October 2006 they initiated a new process, called Regional Cooperation. The commission for the process is as follows:

- The committee will report how the university college's (including Agder Research) outward activity can be organised so as to achieve the best possible constructive interaction with the whole region and with business and commerce in the region.
- As part of the report the committee will show how the five strategic themes can be included in the best possible way in this work.

The commission is a combination of the two previously mentioned follow-up processes. The group is supposed to deliver their report in March 2007. The research director was appointed by the board as the leader of the committee. The other members are the director of Agder Research, one from industry, one politician and a faculty dean from AUC. There was also a reference group appointed with about 20 members. With the exception of one dean, one researcher, and one former rector, the other members are from the region. There is little involvement of researchers in the process.

The second path I will present is organizational changes which seem to be of relevance in connection to the Agder region and the regional role of university. One such change is the decision to re-locate the Centre for Entrepreneurship from the Faculty of Economics and Social Sciences to the university college director's office. The centre is one of six centres that have been established during the last five years in the Faculty of Economics and Social Sciences. The centre has had a high profile in connection with regional actors such as the Competence Foundation and has organized a lot of different courses in entrepreneurship for students, and some of them have also been organized together with industry.³⁶ The reason for the organizational change is given as follows:

The university college director points out that entrepreneurship is a defined area of focus for the university college and recommends that the centre should be organised as a shared, cross-faculty effort... The university college director sees it as fundamental that the centre will be a shared effort between the university college and Agder Research and will give entrepreneurship a common profile in relation to the outside world. The aim of the centre is to increase Agder Research's and AUC's activity in research and education and teaching entrepreneurship. To ensure a solid foundation for AUC, Agder Research and any external interested parties such as The Competence Foundation, a broadly based election committee will nominate a small, operative board for the centre. The university college board appoints the centre's board (HiA 2005a).

By relocating the centre to the university college director's office the centre is given a higher status seen in relation to other centres in AUC. This status is also used to give preference to, for example, applications to the Competence Foundation. There have also been discussions about whether the centre could cover the region's industrial development and innovation (HiA 2005c). This subject is one of the five strategic subjects in the strategic plan for AUC. This would expand the area of responsibility for the centre quite considerably and affect other centres such as the Centre for Innovation and Working Life, which also works with regional topics, but from a research approach.³⁷

To sum up: The strategically organized processes demonstrate an increased attention towards the question of Agder University College regional role, but so far the role has not been discussed in any depth. One outcome with relevance for the regional role is the re-location of Centre for Entrepreneurship to the university director's office. The aim was to create a clear

³⁶ In chapter nine I will present how the centre organizes the meeting between students and industry.

³⁷ The Centre for Innovation and Working Life will be presented under the heading *collectively research organized processes*.

and common profile in relation to regional actors. The regional role seems to be interpreted as a need to make a distinct and common profile in relation to the region.

An outcome from the Thematic Group seems to imply a belief that Agder Research can institutionalise a part of the regional role. According to Brulin (2004) the experience from Sweden is that such an organization solution will risk institutionalizing the regional role in Agder Research, and not connect Agder University College to the processes in the agora.

Another outcome from the Thematic Group was that the disciplinary approach from the newspaper discourse was connected with the disciplinary knowledge in the university college. The result of this connection was creation of disciplinary knowledge. The aim for the Thematic Group was to create transdisciplinary knowledge, but in the case of the theme *Industrial Development and Innovation* this approach disappeared more or less in the report. This illustrates that it is difficult to create transdisciplinary knowledge in university even when the aim is transdisciplinary,

8.2 Management organized processes

These are processes initiated by the university college director and/or the research director after consultation with the rector. These kinds of processes are not necessarily so easy to observe and identify as board-initiated processes are because they do not necessarily exist as codified information in, for example, reports.

When I did my interview round in January 2005 there were not many management organized processes. A year later when I had an interview with the research director the number of initiatives had increased. Many of the management-initiated processes are minor actions judged individually, but seen together over a time period of nearly two years they represent a distinct change in AUC's regional role with industry. The main actor behind the initiatives from the university college director's office is the research director. The list I present in the following is probably already outdated because new initiatives are being added to the list and old, finished initiatives are being removed from the list. The list I present here is therefore more an illustration of the kind of processes the research director is engaged in, rather than a complete and updated list. The management-initiated change processes include:

- A new position as research executive officer at the university college director's office. This position comes in addition to the position as research director and is intended to ease the work load for the research director and to enable the university college director's office to take new initiatives and administrate already initiated initiatives.
- New partnership agreements are supposed to be signed and administrated by the university college director's office. The reason is partly that the university college director wants to have an overview of such agreements with regional actors and partly because regional actors want to have a long-term partnership agreement with AUC in different subject areas.
- The administration of an *Industry-College Collaboration Scheme* project from the Research Council of Norway. The aim of the project is to promote change at the institutional level in university colleges and enable them to become more active partners and knowledge suppliers for companies that are seeking R&D help (NFR 2005: 1). In the project description of the Research Council the need for better internal coordination is emphasised. One reason for the argument for better internal coordination is to ensure that AUC is more transparent for all potential regional actors. Another reason is to increase the motivation of researchers to cooperate with industry. The project description was created through cooperation between industry, the public sector and a researcher from Agder Research. No researchers from AUC participated in the process. The programme has given the research director money to initiate and participate in projects together with researchers and industry. So far it is mainly projects in technology that have been supported. The processes that have been given economic support from the Industry-College Collaboration Scheme administrated by the research director include:
 - Establishment of a website for the exchange of students' theses and part-time jobs from industry and the public sector. The initiative behind the website came from regional actors. The website became operative in September 2006.
 - Participation in specific networks with industry, such as:
 - ICT systems and services,
 - Offshore, drilling and transport of oil,
 - Agder ICT Centre
 - NODE (Norwegian Offshore and Drilling Engineering).

Seen together these changes represent a stronger management profile in AUC towards the region. When I had an interview with the research director in June 2006 I asked him about the reason behind this increase in initiatives from the university college director's office. He confirmed the change, and said that the strategy was developed in consultation with the rector and the university college director. One important reason for the strategy was the heavy criticism from the media in 2005. The media accused AUC of being invisible with regard to the region and of lacking a strategy towards the region. The research director said that the aims of the strategy are to be more visible for regional actors and to have a proactive role in regional development; i.e. to fulfil the intention in the legislation for universities and colleges.

The research director also said that that the upturn in the Norwegian economy has increased the interest for cooperation with Agder University College from the industry in the region. One reason is the increased demand for labour. It is especially the oil and gas industry, which has shown interest in cooperating with Faculty of Engineering and Science. The research director tells that he has worked much together with the dean and researcher at Faculty of Engineering and Science in order to embed the regional role in the faculty. The cooperation with Faculty of Engineering and Science has so far resulted in the sponsoring from the oil industry of a professorship in the Faculty. The research director has also worked together with the Faculty of Engineering and Science, industry and the Norwegian University of Science and Technology in Trondheim on developing specific education directed at the oil industry.

There has not been so much interest from the industry to cooperate with other faculties, such as Faculty of Economics and Social Sciences. He said that:

Industry has a tradition of going to the Faculty of Engineering and Science, not to other faculties
(interview with the research director).

In this phase it has been most natural to work with Faculty of Engineering and Science the research director tells me. He has used his network from his earlier jobs as dean in Faculty of Engineering and Science and in the industry. He admits that there is a potential to increase the processes between other faculties and the industry.

To sum up: There have since the beginning of 2005 been different management initiatives launched. One reason for the increase in these initiatives is the focus on Agder University College in the regional newspaper discourse.

The main actor in the management organized initiatives has been the research director. He has used his network with industry and with the Faculty of Engineering and Science to develop projects and processes with industry. The initiatives are technology dominated and directed towards specific industries in the region. They are a direct follow-up of the demand for disciplinary knowledge from the regional actors in the newspaper discourse.

8.3 Collectively research organized processes

These kinds of processes are in the core mission of university. It is education and research. The organizational design of the processes is collective. In addition to regional actors, the design involves researchers, administration, and possibly students if the process has educational purposes. The process is formalized, for example, in partnership agreements, codified with descriptions of routines and there are databases with lists of participating regional actors. Since it is a part of the core mission it is usually financed from the institutional budget. The regional actors usually do not pay for participation in the process, nor for the outcome of the process.

The data I present in this section is mainly from the interview round in January and February 2005, in the period when the newspaper discourse was at its peak. The discourse made it easy to talk about the regional role of AUC. There was diversity in the opinions about the subject. For many of the interview subjects it was a new experience that Agder University College should or could have a regional role. They had not reflected on the possibility that a university should be actively engaged in the region. Teaching and research were the tasks it should be concerned with. The programme coordinators were especially concerned about the students. The students were priority number one for them.

Those of the interview subjects that had cooperation with industry were more positive to cooperation than those that had no such experience. This difference did not follow any faculty border, but an informal department border connected to the programme coordinators.³⁸ Most of the programme coordinators were most concerned about the education part because it was their responsibility. The one without any connection to regional actors were not so much concerned about the regional role of Agder University College. The one with experience with

³⁸ In 2003 AUC decided to remove the departments as an organizational decision unit. Informal the department structure have survived. In 2006 the department structure was re-established as a formal unit in AUC as a result of a proposal from the *Organizational Process*.

regional actors meant that this was a role that AUC should have a clearer opinion about. As one of the programme coordinators said:

There is a danger that AUC is becoming isolated from the region. It is important that the students, through their education, cooperate with industry. When the students do so, this will also involve the researchers at AUC.

The main process Agder University College has with regional actors is through the students work with their Bachelor's projects and Master's theses. The involvement in student processes can be measured both in man years, number of students, credits, and organizations and companies in the region. The process that involves the public sector is the largest and the one with the longest tradition measured in time, due to the professional programmes in nursing and teacher education. It is especially the practice part of the nursing programme that involves most regional actors, such as hospitals and homes for the elderly in the region. Half of the Bachelor's degree period of three years a nurse student spends with practice and practice-related activities. There are about 200 student places in nursing each year. This means that about 600 students each year have practical training in different kinds of institutions in the region. Also teacher education has periods of practice, but not to the same extent as the nursing programme.

Table 16: Nursing and credits for the different parts of the programme

Parts of the programme	Credits
Practice	60
Practice preparation	30
Theory	90
Total	180

Source: Study Programme Handbook, Agder University College

Even though processes with industry are fewer than with the public sector, the processes are significant for the faculties and departments involved in AUC and for the companies involved. It is especially the campus in Grimstad with the Faculty of Engineering and Science and the Department of Industrial Management, which is under the Faculty of Economics and Social Sciences in Kristiansand, which have the tradition and experience from participating in processes with industry. Also the Department of Economics and the Department of Information Systems have some participation with industry. Both departments are part of the Faculty of Economics and Social Sciences.

A minor form of processes with industry is visits to companies and guest lectures from companies. More significant processes are the Bachelor's degree and the Master's thesis in the ICT Department and the Master's thesis in industrial management in the Department for Industrial Management. A Master's thesis is a demanding task both for the student and the cooperating company.

In the information box below I have estimated the process with regional actors both in number of students and in man years. Of 161 students on three courses 123 (76 %) of them were engaged in projects with regional actors, mainly with industry. The students contribute over 40 man years free of charge to about 50 to 60 regional actors only in these three courses.

Information box 5: Illustration of cooperation with regional actors – Bachelor's and Master's students in ICT and Industrial Management in 2005

As an illustration of the cooperation, I have in the table below estimated cooperation in man years and number of regional actors in 2005. Based on information from the Department of ICT I have used a factor of 0.2 for Bachelor's and 0.5 for Master's students. About 85 percent of the proposals are given by external actors and 15 percent are theoretical proposals given by staff in the university college. If I had measured the time the staff uses on the projects the factor would have been higher. The intention with the table is just to give an indication of the extent of the cooperation. Most of the regional actors were industry, but there were also some students that had projects with the public sector. I therefore use the concept of regional actor, and not industry, to cover the public sector.

Course	Total number of students	Students in cooperation with regional actors	Estimated man years used in cooperation with regional actors
Bachelor's in ICT	90	63	13
Master's in ICT and Master's in Industrial Management	71	60	30

Sources: the Department of ICT, the Faculty of Engineering and Science, and the Department of Industrial Management, the Faculty of Economics and Social Sciences.

Despite the fact that research is one of the core activities of university it was not possible for us in the interview round to generate data that could give us a good indication of research on regional phenomena or processes with regional actors.³⁹ Neither was it possible through the budget system in AUC to obtain an overview of research activities measured in NOK.⁴⁰ The interview subjects said that the research activities are diverse and individualized, and that it would be hard to gain access to this kind of data. Research seems to be acknowledged as the individual researcher's responsibility. Neither is there much cooperation between researchers in a department and the cooperation is even less between departments and faculties. In a letter to the dean of the Faculty of Economics and Social Sciences, one programme coordinator puts it in this way:

There are many of the teaching staff that are active as researchers in specific fields, but they could have had more joint research projects and joint publications.

The individualistic profile both in research and teaching is not a special phenomenon in this department but is a more common phenomenon in Agder University College. The researchers' networks extend to researchers in other universities. Many of the researchers cooperate in research projects with other researchers from other universities and publish with them. Mainly there seems to be a lack of a critical mass of researcher within specific themes and subject areas. However, there are two exceptions to this individualized research profile. The first is the PhD programmes and the second is the organization of researchers in centres.

To be approved as a new university in Norway two of at least four PhD programmes must have regional relevance. The two with regional relevance in Agder University College are *Mobile Communication Systems* organized by the Faculty of Engineering and Science, approved in 2005, and *International Management* organized by the Faculty of Economics and Social Sciences, approved in 2006. Both PhD programmes have recently been approved but it will still be a few years before the first candidates have gained their degrees. The two other PhD programmes are Mathematics Education, approved in 2002 and Nordic Language and Literature, approved in 2000. The first doctoral candidate to complete a programme at AUC

³⁹ "Us" means the public relation manager and myself, cf. the presentation of how I have generated the data in chapter six.

⁴⁰ In the budget for 2005 external financed activities were stipulated as NOK 46 million (excluding post-graduate education, further education and research fellows from the Ministry of Education and the Norwegian Research Council).

was in Nordic Language and Literature, and the subject of his PhD had regional relevance. It was a study of local dialects in Agder.

Similar to the PhD programmes, the clustering of researchers in centres is a phenomenon that has developed in AUC since the turn of the millennium. Several of the centres have been set up as a result of the establishment of the Competence Foundation. The regional money from the Foundation made possible clustering of researchers wanting to do research on regional phenomena in Agder or wanting to cooperate on generating knowledge with regional actors. Most of the centres in AUC are located under the Faculty of Economics and Social Sciences.⁴¹ Mainly they are managed by the researcher that initiated the centre. Some of the centres have a board with internal members from AUC, others have an external board, some have an external reference group and some have no board at all. They are designed around a core of researchers on a part-time basis from AUC and Agder Research, and some of the centres have also hired researchers from other universities on a part-time basis. The PhD programmes are more streamlined than the research activity in the centres. The centres differ in the number of researchers connected to the centre, the activity in the centre and their profile. The centres are presented in the table below.

Photo 1: The Campus in Kristiansand



Photo: Anders Martinsen

⁴¹ The Faculty of Education has two centres.

Table 17: Centres at the Faculty of Economics and Social Sciences with regional relevance

Name of centre	Aims	Organizational design
Centre for Entrepreneurship	Research and education in entrepreneurship and business development	Relocated from the Faculty of Economics and Social Sciences to the university director's office in 2005. The centre has a board where the chairman of the board is the research director at AUC. The other board members are external. The centre cooperates with Agder Research and has financial cooperation with Innovation Norway and the Competence Foundation
Centre for Property Governance	Applied research and education in property governance	Cooperation with Agder Research
Centre for Innovation and Working Life	Research on innovation processes in industry and working life in the Agder region.	Cooperation with Agder Research
Centre for European studies	Economic, social and political integration processes in Europe from 1945 to the present.	Cooperation with Agder Research. The centre has a board with members from different faculties in AUC.
Centre for International Economics and Shipping	Research and education in international and maritime industry.	Cooperation with Agder Research
FUNK ⁴²	Research and education in management, strategy and project control in the culture sector.	The centre has an external reference group.

Source: WEB pages AUC and HiA (2006a).

The number of researchers connected to each centre varies from just a few up to 15 researchers. Some centres have a high activity, such as the Centre of Entrepreneurship, which offers a lot of courses. Others have had decreasing activity after their start up and some are so recently established that they have not managed to initiate much activity in the centre. They offer a mixture of education, research and applied research. The only centre that has a pure research profile is the Centre for Innovation and Working Life, with its focus on innovation and working life in the “knowledge economy”. Applied research is said to be Agder

⁴² FUNK is a Norwegian acronym for research, education, business and culture.

Research's responsibility. With the exception of FUNK the other centres cooperate with Agder Research.

To sum up: The students' processes with regional actors represent the majority of the processes Agder University College has with regional actors. The tradition of and experience with cooperation with regional actors through students' projects is much more established. AUC has most students' processes with the public sector due to the professional programmes in nursing and teacher education. The Faculty of Technology has most processes with industry in the region. Also the Faculty of Economics and Social Sciences has students' processes with industry.

The research processes are so far fewer in number, smaller in regional contribution, smaller in participation with industry and smaller in their contribution to industry compared to the students' processes. Research *on*, and especially *with* regional actors is a relatively new approach at Agder University College.

8.4 Individually research organized processes

These are processes designed by an individual researcher in collaboration with actors from the region. The researcher participates with regional actors on an individual basis with his or her knowledge. The process does not involve other researchers in AUC or the management level in faculty or department. Another common factor is that the process is a result of the researcher's knowing how. The researcher knows something that he or she wants to test out or the researcher is asked by actors in the region to contribute with his or her knowledge. A third common factor is that participation in these kinds of processes is accepted in the institution. The processes have an institutional legitimacy. The processes can be differentiated in the kind of regional actors, for example industry, the public sector or civil society. A fourth common factor is that the researcher gets a fee of some kind from the regional actor for participating in the process. However, the other design factors vary. The processes differ in aim, time perspective (short versus long), the number of regional participants, the facilitation of the process, and the financing of the process depending on the needs specified by the regional actor. The process is negotiated and cogenerated between the researcher and the regional actors, where the needs of the regional actor and the researcher's knowing how are the most important factors for deciding the aim and design of the process.

The individualistic participation by researchers in AUC, the quantity of the processes and the temporariness of the processes make it hard to obtain an overview of them. The processes are not mapped or documented anywhere in AUC. They change all the time, they start, they stop and they last for a while. A mapping of these processes would therefore be outdated very soon. An attempt to keep an updated overview would require that each researcher reported every time they started and ended a project. My experience with universities and research institutions is that such a list is hard to keep updated over time. These kinds of processes have existed for a long time and they will probably last for a long time also in the future despite their temporality. This activity seems to be accepted within the university college. The processes we identified included:

- Lectures and talks: Many of the interview subjects said that they or their research colleague were invited to give lectures and talks.
 - o Lectures and talks for the civil sector: In the civil sector the invitation could be from a local historical organization or Rotary. This was usually done in the afternoon and it was paid for with a bottle of wine or a bunch of flowers.
 - o Lectures and talks for the public sector or industry. This could be organized as a part of a programme in a seminar or a meeting. It could happen in daytime or in the evening. The fee is usually more than wine or flowers.
- Board representation: Many of the interview subjects told us that either they or their colleagues were members of boards in companies, in the public sector, such as in hospitals, or in municipal councils, or in the civil sector.
- Popular science contributions: This ranged from newspaper articles, chapters in books edited by someone in the region, to different kinds of books such as history books about the local community or a specific industry.
- Part time jobs: There were not many that had such jobs in addition to their ordinary job in AUC.⁴³ It was more the exception than the rule that someone had a part time job in a company or in a research institution in the region.
- Consultancy firms: The number of researchers with consultancy firms varied from faculty to faculty and from department to department. For instance in the Faculty of Economics and Social Sciences, the Department of Economics, it was said that most

⁴³ Some of researchers had part time research positions in other universities.

of the researchers had a one-man firm. The few researchers that were not organized in this kind of academic capitalistic processes were said to be the exception to the rule.

To sum up: The individually research processes are hard to map. There are a lot of these kinds of processes with the civil sector, the public sector and industry. This activity seems to be accepted in the university college.

I will now look more closely at the distribution of companies that cooperate with Agder University College.

8.5 Distribution of companies that cooperate with the Departments of ICT and Industrial Management

The companies the departments cooperate with in students projects are mainly located in the Agder region. The companies that contribute with Master's theses in ICT are mainly ICT companies and they are also mainly from the Agder region. In 2005 the list from the ICT Department showed 39 participating companies. 24 of them, 62 %, were from the Agder region. The dominance of the ICT cluster from the eastern part of the region to Kristiansand is also possible to trace in the list from the Department of ICT. There are no ICT companies on the list that are located in the western part of the Agder region.⁴⁴ The majority of the companies from the Agder region are located in the university towns Grimstad and Kristiansand. 19 of 24 companies are located in these two towns.

Table 18: Location of companies that contributed with Master's theses to the Department of ICT in 2005

Region	Number of companies	Percentage
Agder region	24	62
Oslo region	7	18
Other regions	8	21
Total	39	100

Source: Department of ICT

The regional dominance is even stronger in the list from the Department of Industrial Management. All 20 companies that cooperated with the Department were from the Agder

⁴⁴ For the local ones: There were no companies that were located west of Lindesnes municipality in Vest-Agder county.

region, and 18 of them were from the eastern part of Agder. There were only two companies from the western part of the region, and they were from Kristiansand.

The department cooperates with companies within different kinds of industry. The list of cooperating companies shows the diversified character of the industry in the region, with different kinds of ICT companies, a furniture factory, maritime companies, and a fishing equipment factory, which are just a few of the companies involved. Even if the companies are located in the eastern part of the region, they are more evenly distributed along the coast line from Kristiansand towards the county boarder of Telemark region in east. Only 5 of 20 companies are located in Grimstad where the department is located.

8.6 How much interest is there outside the university college towns in cooperating with AUC?

I participated in two meetings with industrial organizations in two small municipalities in Agder: Flekkefjord and Mandal. Flekkefjord is a municipality in the western part of Agder, about two hours' drive from Kristiansand and nearly three hours from Grimstad. Mandal is about 35-40 minutes' drive from Kristiansand, and is a part of the outer fringe of the Kristiansand region.

The participants in the meetings were general managers and/or owners of the companies they represented. There was no special business sector dominating the meeting, but rather a diversity of business such as shops, manufacturing industries, engineering companies, ship building companies etc. The diversity of companies in the meeting is a mirror of the diversity in the business sector in Agder, and especially the business sector outside the university towns of Kristiansand and Grimstad.

Information about Agder University College was one of several subjects on the agenda in the meeting. One representative from Agder Research presented a cooperation project, after which I asked two questions: The first was whether those present had had or have any connection at all with Agder University College. The other was whether they wanted to have more information about Agder University College.

Table 19: Companies with cooperation with AUC and the desire for cooperation with AUC

Date	Name of industry organization	Number of participants	Number of companies that have had some form of cooperation with AUC	Number of companies that wanted to have more information and cooperation with AUC
02/07/2005	Flekkefjord Næringsforening	14	0	4
02/16/2005	Mandal Industriforening	21	3	3

As the table shows only three companies answered yes to the first question and only seven yes to the second question. The answers give an indication that the bulk of industry in the Agder region, which is small and medium sized companies, has very little cooperation with AUC, and does not necessarily want any cooperation with AUC. Most of them are not producing knowledge intensive products, nor do they have a complex and scientific knowledge intensive production process. For such a company to engage in a cooperation with AUC would require a lot of time, and time is a scarce resource for such companies. After the meeting was finished in Mandal, a manager of such a company said to me:

I am not sure if we have the necessary resources to engage in cooperation with Agder University College. ... And I am not sure if we have enough time for cooperation.

The companies that had a connection or want a connection were companies that have managers or employees with a university education and were in a business where university knowledge, such as technology or economics, was of interest for the further development of the company.

Some of the companies in the meetings had a relationship with other universities, and seemed to be satisfied with this relationship. They were more inquiring about a future relationship with Agder University College. As one of the managers of a shipbuilding company said:

What can Agder University College offer? What is your product? Why should we have cooperation with Agder University College? If I want technology, I prefer NTNU (The Norwegian University of Science and Technology).

The questions demonstrate a market transaction relationship with university. The company is a potential buyer of knowledge. The utterance from the manager also demonstrates a trust in the products they get from NTNU, and a more sceptical attitude towards Agder University College, since they do not know the college. NTNU has a profile and a reputation as a technological university in Norway, where most of the graduate engineers in Norway have been educated for a long period of time.

The above discussion gives an indication that Agder University College does not have much cooperation with industry outside the regions of the campus towns of Kristiansand and Grimstad. There is a minority of companies that have cooperation with Agder University College, and some companies have cooperation with other universities. So, more likely it is only a minority of the roughly 26,000 companies in Agder that have the interest, the knowledge, and the time to cooperate with Agder University College.

8.7 Discussion

The questions I stated in the beginning of the chapter were:

- a. How are knowledge creation processes with regional actors organized at Agder University College?*
- b. Who is participating in the processes from AUC?*

The most direct and observable findings from the interview about processes between Agder University College and regional actors are the following:

1. The process of discussing the regional role of Agder University College has recently started in the university college. The regional newspaper discourse seems to have triggered the discussion of the regional role.
2. The regional newspaper discourse has also initiated a change process in Agder University College in both strategically organized processes and management organized processes. One outcome of this is the recognised need to create a clear and common organizational profile of the university college in relation to regional actors.

3. The main outcome of the strategically organized processes and the management organized processes seems to be disciplinary knowledge in the form of technology, where the main actors are the research director and the Faculty of Engineering and Science.
4. There are a lot of processes in the agora between Agder University College and actors in the region.
5. Most of the processes with regional actors are through the students' Bachelor's projects and Master's theses.
6. Most processes are with the public sector because of the practice part of programmes such as nursing.
7. The Faculty of Technology and Science and the Faculty of Economics and Social Sciences have most processes with the industry.
8. The industry in the region that already cooperates with AUC is mainly located around the university college's campus towns of Kristiansand and Grimstad. There is also some interest from companies outside the two towns in cooperating with AUC. But cooperation with AUC requires time and knowledge that to a certain degree matches the knowledge AUC can offer.

These findings imply that the agora covers many different kinds of knowledge creation processes. The newspaper discourse presented in chapter seven has resulted in an increase in both strategically organized processes and management organized processes. The relationship with the region and especially with industry and policy makers has been an item on the agenda in these two kinds of processes. So far the regional role of AUC has not been discussed in any depth in AUC or with regional actors. Processes that involve regional actors seem to be organised with few participants from AUC, and little involvement of researchers, such as the process called *Regional Cooperation*. The regional role seems to be defined as a theme that mainly concerns management in AUC and regional actors. There is little involvement of the researchers in these kinds of processes. However, it is the researchers, either through their own processes or through the students' projects, who have most cooperation with regional actors. Since the researchers are not participating in the strategically organised processes, the processes lack an important actor and an important kind of knowledge; which is knowing how from processes in the agora.

The participants from the region in the strategically organized processes do not necessarily themselves have knowing how from participating in knowledge creation processes with AUC.

This implies that the ones who participate in the strategically organized processes do not themselves have knowledge from concrete knowledge creation processes between AUC and the region. There is no matching of relevant knowing how between AUC and regional actors in the strategically organized processes. The lack of connection between the one that is responsible for the strategically organized processes, and the ones that actually have knowing how from cogenerative processes, is a weak side with the organizational design of the processes. If the processes do not compensate this lack of knowledge with studies of processes in the agora in the Agder region, the risk is that the processes will not connect to the reality in the agora. The processes will only result in new theoretical knowledge that is not necessarily useful for the ones who is going to try to implement the knowledge in the agora.

In the table below I have summarized the main outcomes from the different processes. In the first typology, strategically organized processes, the main outcome is codified information-/theoretical knowledge and organizational changes. There are different kinds of information and knowledge involved in the processes. Some of the outcome is disciplinary knowledge and some is of a more transdisciplinary character.

Table 20: Findings from the different processes

Actor	Management	Researcher
Organizational design Collective	I. Strategically organized processes - Codified information/theoretical knowledge in the form of newspaper articles plan and reports. - Disciplinary and transdisciplinary knowledge. - Organizational changes such as mergers of faculties and relocation of the Centre of Entrepreneurship.	III. Collectively research organized processes - Theoretical knowledge such as PhD theses, research articles and reports, Master's theses, Bachelor's reports, and reports from different kinds of courses. - Knowing how in organizing students projects with industry.
Individual	II. Management organized processes - Disciplinary knowledge - Knowing how to participate with industry.	IV: Individually research organized processes - Knowing how, theoretical knowledge.

The second typology, management organized processes, has so far only involved the Faculty of Technology and Science, which is the faculty with the most cooperation with industry in the region. The outcome here is mainly disciplinary knowledge. This outcome *may* match the need specified in the newspaper discourse, but not necessarily the ambitions concerning transdisciplinary knowledge in the Strategy Plan.

The third typology, collectively research organized processes, through the students' projects, is the most important cooperation AUC has with regional actors. The main outcome is theoretical knowledge. The researchers that are involved in these processes have built up knowing how about participation.

For the last typology, individually research organized processes, I have assumed that the outcome is information, theoretical knowledge, and specific knowing how from cooperation with regional actors. Those that have long experience from cooperation have probably developed a more advanced form of knowing how. The process is dependent on the researcher knowing how and there being someone that knows about the researcher's knowledge and that is interested in buying it.

The typology I created in chapter five have been useful to categorize the different kind of processes.

The students' processes are the biggest in the agora between Agder University College and regional actors. However, the mapping of the organization of processes gave little information about how knowledge is created in the agora. This is the topic for the next chapter.

9. A study of two knowledge creation processes

In the previous chapters I have shown that there are a number of knowledge creation processes. From the universe of knowledge creation processes in the agora between Agder University College and industry I have selected two processes; cf. chapter six. The processes are similar in many features. The main difference between them is the organization of time available for knowledge creation. The first process has plenty time available for both planning and organization of the process and cogeneration of knowledge, while the other process has only a short time available for the cogeneration phase. The latter process is characterized with a short time available for the cogeneration phase of knowledge. The hypothesis formulated in chapter six is as this:

- If the students from the two courses create knowledge in the same way, despite the difference in the time dimension, and a *ceteris paribus* condition on all other organizational dimensions, then there is some taken for granted knowledge about how knowledge should be created when university and industry meet each other in the agora. If they create knowledge differently, the answer has to be found in the specific organizational design of the courses.

The two processes are:

1. Master's thesis in Industrial Management, and
2. FRAM-Gründerlab.

The questions are founded upon the model for organizational design of knowledge creation processes in chapter five. The questions are:

- a. How is the knowledge creation process planned and organized?
- b. Who is participating in the process?
- c. How do the participants cogenerate knowledge together?
- d. What is the main outcome from the processes?

I will start the discussion by presenting the two courses. Then I will present data from the knowledge creation process and the output from the processes. The chapter will end with a

discussion of the main findings from the two processes. The chapter is long because the processes I am describing are complex. The details matter in the processes. I have therefore decided to give a thick description of the processes.

9.1 The Master's programme in Industrial Management

The Master's programme in Industrial Management was arranged for the first time in 2001. The study comprises three modules: business economics, value chain management, and strategy and corporate management. Cooperation and knowledge creation in cooperation with companies is regarded as an important part of the programme. In the original design of the programme the students were supposed to feed back theoretical knowledge to the companies after their first visit to them. However, it soon became obvious that this was too demanding a model. The companies' expectations with regard to the knowledge the students could deliver at that stage were unrealistic seen in relation to the knowledge the students had after only two weeks of study. The process with companies was therefore redesigned. The students still meet a company after the first two weeks, but only as a visit. They are not going to give back knowledge to the company after the visit. The purpose of this visit is to introduce the students to companies and show the students how production processes are organised in real life. Later in the programme the students visit a company over several days where they study the logistics system more thoroughly. It is in connection with their Master's thesis that the students are supposed to engage in a closer knowledge creation process with a company. The workload of the Master's thesis is estimated as one semester of work and is carried out in the spring semester.

The routine for visits to companies and the creation of the thesis statement is well established. The usual way of getting proposals from companies is to send out a letter early in the fall with a request for proposals. The companies that are interested reply with a concrete proposal for a task they want the students to perform. Later in the fall the companies are invited to present themselves and the proposal to the students. It is the students' privilege to choose a proposal and a company. When the students have selected a proposal a formal agreement is signed. The agreement specifies for example the thesis statement and the delivery date for the thesis. Usually the students work in pairs.

I will present the data regarding the students, the companies and the researchers I interviewed as narratives.

9.2 A brief look at a the knowledge creation process

The two students I followed during the spring of 2005 told me that the meeting with the company was their first real encounter with industry where they were supposed to use their theoretical knowledge. They also told me that the process with the company and working life after their graduation looked a bit scary. One of students said that he had had many summer jobs, such as packing boxes, sorting mail at the post office and delivering newspapers, but never a job that matched his education and what he had learned at university. They both emphasized that they had learned to:

manage and work on a big project. We get practical experience through our work with the Master's thesis. We have learned how to obtain huge amounts of data and analyse it.

This is a researcher's education, an education in a spectator-based way of creating knowledge. This was confirmed in the story from the researcher, see narrative 1 below.

Photo 2: Study group on the campus in Kristiansand⁴⁵



Photo: Olav Breen/Høgskolen i Agder

⁴⁵ The students have no relation to the two courses presented in the chapter.

Narrative 1: A researcher's experience from processes with industry

I ask the researcher what his experience is from participation with knowledge creation processes between students and companies. He underlines that his role in the process is as an advisor.

“As an adviser, I meet the company together with the students when the students have a draft they want to present and discuss with the company. The company has of course got the draft in advance. My impression is that the company has read the draft very carefully. The meetings happen in an informal setting, and the companies are usually quite clear in their feedback on parts of the description that are not correct. “Here you have forgotten something, here is something wrong” they can say. The company often adds details to the description, and they do not care so much about the theory. What counts for them is the interpretation of the data, and not theory, at least not directly. Through the interpretation we (advisor and the students) get in connection with the theory, so we connect to the theory indirectly. I feel that this way of working together with the company is a way of cogenerating knowledge. The company has the detailed knowledge, and the students have the concepts and an analytical way of analyzing data. So, both the company and the students learn something new from this. The students learn to collect data and analyze them - to be good researchers.”

Despite this theoretical knowledge the students were insecure about the process with the company. I understood them to be insecure about how they should participate in the knowledge creation process with their company. The students' story together with four other students' stories are shown in narrative 2 below. The stories are generated from a focus group interview with six students. Two of the students that showed up in the interview were Master's students in ICT. They cooperated with the same company as the two students from the Department of Industrial Management I observed during the spring semester.

Narrative 2: The Master's students' story about their knowledge creation process with companies

The narrative starts with my question: "What has your process and cooperation with the companies been like?"

The students looked at each other and then a female student started telling her story: "I was going to do a market research for my company, but just before Easter they phoned me and told me that they had decided not to do the market research. I had to change the perspective of my thesis completely. I am now writing a theoretical thesis, where I use the company as a case. I have now only communication with the company through emails.

Then two male students continued: "We have not co-operated so much with the company. Our thesis has not been of that kind. We have had a closer cooperation with our adviser. We are testing out a method for her, and we are using the company as a case for the method. We have done some interviews with pupils in an elementary school. We have had some meetings with the company where we have presented our findings to them. The company seems to be satisfied with that."

Two other students continued by saying: "Our story is similar. Our thesis is for the same company as yours (the previous students). We have not managed to have a close co-operation with the company. The company came to us with an offer last week about the possibility of sitting in their offices, but we had to refuse it. We are so close to the deadline for the Master's thesis. We have to concentrate on finishing it. If the offer had come earlier, it would have been different."

The last student, who had been listening to the others' story said: "Our story is different. We had a bad start. We have not had a good relationship with our adviser from the university college, but during the last two months we have had meetings with our contact person in the company every Friday morning. It has been very useful for us to know that we are on the right track in relation to the task we are doing for the company. It has been very good for us to see the involvement and the participation from the company."

The story the students tell from the two companies gives an indication that the companies want the students to participate more with them. To check the stories from the students I interviewed the companies that had worked with the students. I interviewed the students' contact persons in the companies. Both interviews confirmed the students' stories.

Below I have presented a story from the director and the technical director in one of the ICT companies, called *Company A*. The company is a three-year-old spin-off from the ICT company Ericsson. Their main product is software recording system and support to customers in relation to the software. The company is a small company with seven employees.

The other company, *Company B*, is also a spin-off from Ericsson. This company is a much bigger company with customers' world wide.

Narrative 3: Company's A story from knowledge creation processes with students

I start the interview by asking why they are cooperating with Agder University College.

The director starts by saying that: "We are quite cynical in our cooperation with AUC. We are using them to get access to knowledge that we cannot get ourselves. We are a small ICT company and this is the first time we are cooperating with AUC, but in return, we have three projects with them."

The technical director continues the story. He says that:

"We had expected that the students would have wanted more information from us, and that they would have been more active in their communication with us. We had also expected that the students would have wanted to work with us in the company, for a period, so that they could see what life is like in a small company. How we do things. We had also wanted to learn from them, to see how they are working."

The director changes to a third project the company is involved in with AUC.

"Two of the projects are with Master's students from AUC Grimstad, and the third one is a course in internationalization, which is called *Internationalization lab*. The course is with students in business administration, from AUC in Kristiansand. The third project is financed by Innovation Norway and has mentors from Innovation Norway in addition to students and an adviser from Agder University College. Personally, I think we get more out of the third project than the other two."

I asked: "Why do you think that?" He answered:

"This project is more intensive and goal-oriented. By May 11 we shall have created an internationalization plan for our company. The students are writing the plan in close cooperation with advisors from Innovation Norway, staff from Agder University College and myself. The communication between the students and myself has been very good. The project is very concrete, it is 'hands on' the whole time. The students get 'real life' out of me. They say this is different than listening to a professor's lecture. I feel that our needs are set in place. We create knowledge together. I feel that I know what is going to be produced, since I am so deeply involved in the project. I feel more secure and confident that this will be a more useful product for the company than the other two projects, which do not compare with this way of generating knowledge."

At the end of the interview the director admitted. "We acknowledge that we have not been clear enough in our expectations about the framework for cooperation with AUC, and I must express the reservation that the Master's students are not finished with their projects at this time. It may be that I change my opinion, when I see the final products, but at this stage this is my opinion."

Both companies I interviewed told me that they wanted a closer participation with the students. They took initiatives to engage in a closer relationship because they wanted to learn from the students and they wanted to show the students what it is like to work in a company.

9.3 The outcome from the process

I followed up the companies in November 2005 by asking whether they had used the product obtained from the process. The director in company A told me that he had changed his opinion about the Master's thesis in ICT.

The Master's project the ICT students did for us was relevant and interesting. We wanted to offer a job to one of the students, but due to the company's situation we could not manage that. If we had hired him, we would have used him to work further with the project.

So even if the company had been disappointed with the process with the students they realized that the Master's in ICT represented a potential for a new market, and the work that was done by the students would have saved months of work for the company. According to the programme coordinator this was not unusual that companies were interested in the Master thesis from the students.

The students' work is in many cases a very important contribution to the development of the companies. Several of the companies therefore use Master's theses as a tool in their strategy for product development. For many recently established companies the use of the Master's theses has been of crucial importance in the start up phase.

There had been several cases where the company wanted to make an industrial product out of the student's Master thesis. His answer to this kind of questions was that the knowledge the students had created was a prototype that needed further testing before they can be commercialized. He also said that he wanted companies to engage with AUC in long term cooperation where the students' work could be seen as part of the strategic development of the company.

What happened with the outcome from the other two processes? The director in company B said that:

The other Master's was too general to be interesting for us, even if the project was theoretically interesting.⁴⁶ The internationalisation plan has been approved by the board, and we are using the plan.

This does not necessarily mean that this Master's thesis in Industrial Management was bad. In fact it was given an A grade. However, the students wrote the following in their thesis about the process with the company:

We acknowledge that we should have been more in the company during our work with the thesis, so that we could experience the usual daily life in the company and their way of thinking. In that way it would also have been easier for the company to eventually take over our relationship with the customer we cooperated with.⁴⁷

This shows that the students had reflected over their process with the company, and that they were able to say what they had lost and the company had lost.

I also had an interview with company B. The contact person told me that due to strategic discussions in the company they had decided not to go into the market area that the students had done a market research on. He rounded off the interview by saying that:

The students did a good job. We will continue to cooperate with Agder University College.

A part of the deal with the students, the researcher responsible for the Master's programme and the companies was that I should write a short note and facilitate a dialogue with the actors involved. However, due to an imminent exam the students were hesitant about participating in this dialogue, and the contact person in the other company was also prevented from taking part in the meeting. The dialogue was reduced to a three participant dialogue: the director in the ICT company, the researcher and myself. We all thought it was important to have the dialogue in order to improve the organization of the Master's thesis.

The dialogue partly reproduces the arguments presented in the narratives. The ICT company director emphasizes why it is important for them to have a closer process with the students. Time matters. I asked the director if half a year is a long period for the company, to which he answered:

⁴⁶ The Master thesis in Industrial Management.

⁴⁷ In the original text the company's name and the customer's name is written. I have made them anonymous in the quotation.

Yes, half a year is a long time for us in the market we are working in. We are a small, dynamic company and have a limited number of customers. We tell them that we are only working with this software product. Our aim is to be best in this field. It is therefore stupid if it is going to be two months before we get information.

After a while the dialogue in the meeting changes character. The researcher admits that the work with the Master's thesis can be improved.

We have to communicate more clearly to the students how they should work.

The researcher acknowledges that the department needs to teach the students more about how they can cooperate with the companies, and how they can cogenerate knowledge with them. The programme has been improved since 2005. The methods course in the fall has been changed. It is no longer only about how data can be generated through interviews and surveys, but has a part that presents the challenges of creating knowledge together with companies. Also the process in the spring has been improved with for example better follow-up of the process between the students and companies, specifying the advisor's role versus the company's role in the process, specifying a minimum of meetings, use of milestones and an end evaluation of the process between the adviser, the students and the company.

9.4 Discussion of the findings from the Master's thesis

There are some main findings from the narratives which I want to emphasize. The first is the random organization of the participation with the companies. The diversity in the stories from the students demonstrates this randomness, which can be analysed more closely using the model, which I created in chapter five: A model for organizational design of knowledge creation processes in the agora.

AUC has an organizational design of both the planning and organization of the processes, of the participants in the process and the outcome of the process. The element AUC does not have a design for is the phase where the students meet the companies; i.e. the cogenerative phase. It is up to the students to decide how they want to design the knowledge creation process. The problem is that the students, at least the students I interviewed, were insecure about how they should organize the process with the company. They ended up with an organization of the process that did not involve the companies much. It is therefore natural

that a company does not care about the theory, cf. narrative 2. They regard the theoretical part as the students' and the advisor's responsibility. It is the data where the company is presented and discussed that they care about. They want the data to be correct and of course they do not want to be presented in a bad light. That is why they care about the details. They have to take what they get from the students since they have no influence on the process. This is probably why the company prefers an intensive process, such as the director experienced in International lab. The argument from the director is that this offers a better opportunity to influence the final product, so that it is tailored to the company's needs.

The above discussion leads to the second main finding, which is that the companies want a close process, which is an indication that they want a cogenerative process with the students. Ownership of a process is one important reason. Another reason is that for companies, such as ICT companies, which are in a strongly competitive situation, a cogenerative process is important. Time matters and even student projects can generate information that can be useful if it comes at the right moment for the company.

The third finding is that even though the process has not been in a cogenerative mode the outcome from a knowledge creation process *can* be seen as a useful product. This was demonstrated by the director in company A. He changed his attitude towards the product from the ICT students since the product they created represented an interesting market opportunity for the company. However, a close process does not necessarily lead to implementation in a company; there are other conditions that also influence this kind of discussion, such as strategic decisions. This demonstrates that even though the process is important, there are also other factors that have influence on the use of the outcome from a process.

The fourth finding is that it was not difficult at all to get the researcher responsible for the course to change the course. I had expected more resistance towards my proposals of changes, but the researcher very fast acknowledged the need to change the course.

Since I only have information from two ICT companies, I do not want to generalize from these findings about other ICT companies. There is a need to study knowledge creation processes between students and ICT companies and industry from a broader scale than I have done in this study.

There is also necessary to study this kind of processes from a participate approach, which I have done in FRAM-Gründerlab. It is a participative approach that can open up the black box of knowledge creation. The next study programme I will present is FRAM-Gründerlab.

9.5 FRAM-Gründerlab

FRAM-Gründerlab is said to be an innovation in a Norwegian business-university cooperation context. It is a combination of a traditional FRAM programme and a business course for Bachelor's students at the Faculty of Economics and Social Sciences at Agder University College. The Centre for Entrepreneurship is responsible for FRAM-Gründerlab entrepreneurs in the first critical phases from idea to market entry.

FRAM-Gründerlab was arranged for the first time at Agder University College in the fall of 2005.⁴⁸ The aim of the programme is to give the students knowledge about how to establish themselves in business through lectures on business planning and through cooperation with entrepreneurs. The course is estimated to be the equivalent of ten credits in work load. The students' preparation for the programme was through lectures in business planning.

In this study I will use the concept of entrepreneur and the concept of company interchangeably. See the information box below for a definition of an entrepreneur.

Information box 6: The FRAM programme

FRAM is a management and strategy development programme for entrepreneurs that have ambitions of economic growth, and are in the phase of market introduction. If the entrepreneur is accepted as a participant in the programme s(he) also gets access to consulting resources given by FRAM advisors. The epistemology of FRAM is based on the exchange of experience between the entrepreneurs and the teachers in FRAM in combination with theory. The programme consists of six gatherings. Two of the gatherings are arranged in combination with FRAM-Gründerlab, and the remaining four afterwards.

An *entrepreneur* in the FRAM programme is defined as a person or several persons that have a business idea and want to realise it by establishing a company or that already have established a company. According to information from the FRAM programme the business idea must have a considerable potential for profit, and must be possible to develop within a short time.

⁴⁸ The programme was financed by the *Competence Foundation* and *Innovation Norway*.

Due to late financing of the programme, just before the Norwegian summer holiday period, and the planned start of the programme in the fall of the same year, the staff responsible for the programme suddenly faced a serious challenge. Should they start the programme then or wait one year? After some discussion they decided to start the programme and started recruiting entrepreneurs. Some of the entrepreneurs they knew from earlier co-operation and some were suggested by the financial institutions. Some of the entrepreneurs had been recruited earlier, but due to late responses from the financial institutions they had decided to refuse to participate on the programme. So the staff had to find new participants. Finding new entrepreneurs to participate in the programme in the Norwegian summer holiday is not easy, and some of the companies were recruited just before the start of the programme. The consequences were that they did not know much about it. Neither was there time for the entrepreneurs to meet each other in advance, to discuss their expectations and how they should work with the students.

The knowledge creation process in FRAM-Gründerlab is described as a compression tank. The idea is that by keeping students and entrepreneurs together in an intense atmosphere for several days, this will create knowledge in the form of a business plan for the entrepreneurs. The main idea is that knowledge can be created in the right “atmosphere” by gathering people and using time as a pressure to speed up the knowledge creation process. The output created in the tank was supposed to be business plans for the entrepreneurs.

The course was planned with an introduction day (in reality half a day) with lectures and a period when the students and the entrepreneurs could meet each other. Then there were two gatherings, which were supposed to be the pressure tank, each lasting three days. There was about one month between the introduction day, and the two sessions. In this period the students were supposed to collect information for the work in these sessions. In the gatherings the students and the entrepreneurs were supposed to work together, and have lectures together. In addition the students were to write out the business plan and prepare a 15 minute presentation for the entrepreneurs and a panel with external representatives from the region on the last day of the last session. The entrepreneurs in addition were to have had their own sessions during the gatherings.

9.6 The participants in the programme

The participants in the programme were nine companies or entrepreneurs from the Agder region, 43 students from Agder University College and a project team/staff of four FRAM advisors, two researchers from the Centre of Entrepreneurship at AUC and myself. Since some of the companies participated with more than one person in the programme the total number of participants was over 60 people.

I was, as mentioned in chapter six, invited to participate together with the project team in the programme, and had a free role in it. I had no responsibility for the whole framework of the programme since this had been designed a long time ago, but I had the task of reporting my reflections to the other project members. I participated in plenary sessions and in some of the meetings between the students and the companies, and I had regular interviews with both the students and the representatives from the companies. I discussed specific situations with the other staff and presented some proposals for change, such as extending the time used on the introduction day, and a meeting between the students and the entrepreneurs in the entrepreneurs' premises.

My argument for extending the introduction time was that there was just too little time for the entrepreneurs and the students to meet and start the knowledge creation process. I partly succeeded with my proposal. The time was expanded by about one hour. When I asked why it could not be expanded to a whole day, the answer was that there was not enough money to do that. The budget for the programme restricted this.

My other proposal was followed up. My argument was that to meet a company in its "home" environment is different from meeting it at Agder University College. Many of the students had never been in an ICT company, a catering company or in a fish farming location. The students said that the visit to the company gave them another perspective on the company and the product. It is one thing to hear a short presentation and have a discussion about a subject, but it is quite another to see the product and the company in real life. The product and the company were no longer a theoretical problem, but a real problem formulated by a real company.

I also suggested was to drop the lectures in business planning. After the first lectures the students thought they were meant for the entrepreneurs and the entrepreneurs thought they were meant for the students. The intention with the lectures was to “give the participants” some “knowledge” as one of them put it. However, since none of them that received this “knowledge” regarded it as “knowledge” the lectures were dropped.

The entrepreneurs were a diverse group with regard to age, experience from business, and which phase the company was in. However, with regard to gender, only two of the entrepreneurs were female. The youngest entrepreneur was 28 years of age and the oldest 58 years. The average age was 40. Many of them had experience from earlier business activities. Four of them had more than seven years’ experience and four less than two years’. Some of the entrepreneurs had already commercialised their ideas and been in business for some years, some had very recently started up, and some were on the starting blocks, ready to start.

The reasons for their participation in the programme were diverse. Some were interested in the programme itself, some were interested in participating with Agder University College, some were interested because they knew someone that had participated in an ordinary FRAM programme. In the table below the information from the entrepreneurs is summarised. The companies are anonymous. The column with the entrepreneurs’ idea is their own formulation from the presentation the introduction day. I have further classified the kind of knowledge they wanted from AUC, and judged the stage of commercialization of the product. By “process” I mean that the company is offering knowing how in relation to the product they offer. The table shows the diversity in ideas from a highly sophisticated technological product, which had taken years to develop, to more traditional advertising products.

For companies one to six, the main idea is to make and sell a product. The last three companies are offering both process and product. Company number seven has the idea of renting an outdoor scene with personnel for concerts and other kinds of performance. Company number eight is going to make advertising material and a profile for companies in the area where the company is located. Entrepreneur number nine is the only company with the idea of making a “product” out of the entrepreneur’s knowing how to feed fish spawn. Six of the companies are in business, and some of them have already been so for a few years, while the remaining three companies were close to market entry.

Table 21: Summary of information about the entrepreneurs and their ideas

Company number	Idea formulated by the entrepreneur	The kind of knowledge they wanted from AUC	Classification of idea	Is the idea commercialized?
1	From project to a commercial company	Market research and Web-page	Technological product - Scanner and speaker for dyslectics	No, product is yet under development, but company is established
2	Marketing and presentation of company	Business plan	Technological product - Web-based account management system	Yes, company is established and is in business
3	How shall we expand? How shall we find customers?	Market research	Technological product - Web-based solution for marketing and sale	Yes, company is established and is in business
4	Find investors fast and get capital	Find investors	Technological product - Pill dispenser for medicine	No, prototype is ready and company is established
5	Sell product to students and colleges with nursing programmes	Market research	Software product Computer-based journal system for nurses	No, but product is developed
6	As much food as possible to as many people as possible in shortest time	Market research	Food product - Food processing including fast cooling and freezing of the finished product	Yes, company is established and is in business
7	Rent of stage and personnel for outdoor concerts	No special wish due to late recruitment to the programme	Product and process	Yes, company is established and is in business
8	Capital need, identification of markets and the right customers	Market research and update of business plan	Process and product Advertising and image making	Yes, company is established and is in business
9	Make a product out of our knowledge and identify our market	Make a product out of our knowledge and make a web-page	Process – Advise on fish farming about feeding of spawn and more mature fish	Yes, company is established and is in business

When I asked the entrepreneurs about their expectations concerning the cooperation with the students, only two of them could express this clearly. The common factor for these two entrepreneurs was that they were familiar with Agder University College from earlier. One

had been a student and the other had cooperated with AUC in a product development and product test phase. The former student said:

I am interested in the students' pedagogical approach and their theoretical background. I also expect the students to be good at using their theoretical knowledge in a practical application, and that they have a market approach. I also want their theoretical approach to our businesses plan.

A third entrepreneur had been working at another university and wanted to get to know AUC, but besides that she had no clear expectations for the process with the students. The other entrepreneurs were more uncertain about obtaining a contribution from the students. These answers show the same pattern as I spotted from the companies in Mandal and Flekkefjord. If you do not any thing about AUC you are insecure about contribution from the university college. If you have knowing how from earlier knowledge creation processes it is easier to specify what you want from the university college in a future process.

Most of the students that participated in the programme were in their early twenties and 75 percent of them were males. The majority of the students were from the Faculty of Economics and Social Sciences and the rest from the Faculty of the Humanities. Some of the older students had experience from business. Several of the students said that they had plans for establishing their own company after they had finished their education.

9.7 A look at the knowledge creation process

The first meeting between the participants in the FRAM-Gründerlab was the introduction day, which was actually only half a day, from morning to lunch. The programme was organised in three parts. The first part consisted of an opening speech by the director of Innovation Norway in Agder and a professor from AUC, followed by the programme leader from the FRAM programme in Norway and the project leader for the FRAM-Gründerlab, and finally finished with a short lecture by me about knowledge creation. In the second part the entrepreneurs presented their idea and their company.

The third part was the concrete meeting between the students and the company with the staff in an observation role. There were nine groups with four to six students in each group. Including the break, the first two parts were designed to last three hours and the last part was

designed to last one and a half hours, including lunch. My fear that this was too short a time to start a knowledge creation process turned out to be the case. The design of the introduction day was too intensive. There was too much information in too short a time. When the students and the entrepreneurs finally met in the third part they were unsure about what they should do. One and a half hours to discuss and make decisions on these subjects was far from enough time. When in addition it turned out that the students' expectations in some of the groups were far from the entrepreneurs' expectations, the situation became chaotic. The following outburst from one of the entrepreneurs illustrates the situation:

Does anyone know what we are going to do? I don't know.

Many of the students had the expectation that they should make a business plan for the entrepreneurs, since the topic of the course the students had taken was business planning.

In the first place we thought we were to write a business plan for the entrepreneur... We had got the instruction manual handed out.

Since most of the entrepreneurs already had a business plan, they had other requests, cf. the table above. This created some frustration and much discussion. Some of the entrepreneurs wanted the students to design a WEB-page, others wanted market research done. One of the entrepreneurs wanted the students to find investors for him, and some wanted a new business plan. One and half hours of group work did not remove this uncertainty. By the end of the introduction day both students and entrepreneurs were still in doubt about the task they were supposed to do, how they were to do it, and who was responsible for the process: the students or the entrepreneur? Even though the uncertainty was reduced during the following two gatherings, the uncertainty followed the programme like a shadow to the end.

During the time between the introduction day and the first gathering it became obvious that many of the entrepreneurs' ideas were not as clear as they sounded on the introduction day. One of the other staff members said to me that he had underestimated the difficulty for the entrepreneurs to make their ideas clear to the students.

Getting into the entrepreneur's thoughts and his way of thinking takes more time than I had thought. The entrepreneurs have not managed to explain about their idea and their product in a clear-cut way to the students.

One of the groups I participated in took nearly a whole day to find out that the entrepreneur was actually talking about several ideas, and that some of them were conflicting. Each of the ideas involved different strategies, and were actually different tasks. The entrepreneur wanted to realise them all at the same time, but towards the end of the day he acknowledged that the strategies were conflicting and that he had to choose between them.

Another of the entrepreneurs said the following about the product idea:

My concept is a big challenge for the students. What I am going to sell is too complicated for the students to understand.

At one point, during the first gathering, both entrepreneurs and students were resigned. The students were resigned regarding the process with the entrepreneur, and the entrepreneur with the students. One entrepreneur thought it was due to too little communication; i.e. that the students had not asked for enough information and for the right information, while another thought it was due to bad communication, and a third thought that the students could have done better. In one of the groups all these three factors were present and the frustration increased during the meeting till first the entrepreneur left the room and then the FRAM advisors followed after. I discovered this and went into the room and talked with the students. After some discussion with them I asked if I should get another of the advisors to participate with them. They agreed and another FRAM advisor entered the room. After some discussion with the students he suggested that the students should use a product market matrix, and draw it on the white board, and he said:

Try to use this as a tool... analyse the company... use it as a basis for the business plan.

Then they worked together for a while with filling out the matrix with information they had got from the entrepreneur. The students realised that they needed to generate information from other sources and finally they got into a knowledge creation process, but without the entrepreneur. The students were happy about the solution, because they knew the tool from their studies, but the entrepreneur was not so happy. She did not feel any ownership of the product the students created.

There were many of the entrepreneurs that thought they had used a lot of time on educating the students and that the students should have had more knowledge about their business

before they started the course. However, they realised after a while that neither the students nor the staff had specific knowledge about their business, and that they had to give the students as much information as possible. On the last day of the programme one of them said that:

I have educated them in the catering business.

In the last gathering the relationship between the entrepreneurs and the students had become more positive, not in all groups, but in some.

One reason for the change is probably that the plenary session was split into smaller groups. The original schedule for the gatherings was that each morning the students were to report back to the plenary what they had done. In the first gathering the report from the students was a linear transfer of information from the students to the plenary about what they had done.

The other reason was that the entrepreneurs, students and staff began to ask questions and discuss the information from the students. The students later said to me that this change was important. It changed the process for them. They got “under the skin” of the product and the company. Suddenly they had enough knowledge to question the plan and the strategy for the company and could present other solutions and discuss with the company more on an equal footing. The satisfaction expressed by one of the companies is an indication of the change:

They have done a very good job... Maybe, because three of the students are telephone sellers. They have called around and collected a lot of useful information... I am actually considering offering one of the students a job.

The students’ knowledge, their willingness to generate information and the entrepreneur’s needs matched in the process.

9.8 The outcome from the process

In the table below I have compared the challenges from the entrepreneurs formulated on the introduction day with the codified output the students presented during the last gathering. In most cases the students delivered the product the entrepreneurs asked for. However, there is one case where the expectations of the entrepreneur were completely different from the output. FRAM-Gründerlab was not the right place to find investors.

Table 22: Comparison of challenge from the company and output from the process

Company number	Challenge from company	Output of the knowledge creation process
1	Market research and Web-page	Market research and sketch of Web-page
2	Business plan	Business plan
3	Market research	Business plan and market research
4	Find investors	A critical review of the business plan and strategy
5	Market research	Market research and product test
6	Market research	Business plan with a special emphasis on market
7	No special wish due to late recruitment to the programme	Business plan
8	Market research and update of business plan	Market research and business plan
9	Make a product out of our knowledge and make a web-page	Business plan and sketch of Web-page

However, even though the students tried to give the entrepreneurs what they wanted, and they created theoretical knowledge in the form of a business plan, a market research or a draft of a web-page, it is not the same as if they had meet the expectations from the companies. I have already indicated that many of the companies were not satisfied with the output from the knowledge creation process. On the last day I wanted to see if they had changed their opinion during the process with the students. One of the questions I used so as to get an indication of the usefulness of the knowledge the students had created was the following: *Would you use the product the students have created?* In the table below the answer is shown. None of those interviewed said that they would use most of the codified output from the knowledge creation process, but 8 (67 %) said that they would use some parts of the product, and three (25 %) said that they would not use any part of the product.

Table 23: Entrepreneur: Do you think you will use the product the students have made for you? (N=12)⁴⁹

Answers	Percent
Yes, most of it	0.0
Yes, some parts of it	66.7
No	25.0
Don't know	8.3
Total	100.0

⁴⁹ There were nine companies and twelve participants from the companies.

I also asked the students for their opinion about the process. Many of the students had said to me that they were disappointed. They had expected something else, such as meeting newly-fledged entrepreneurs with only an idea and nothing more, whom they could help. Others had hoped that they would learn more about the challenges of establishing a company. Yet others were more positive about the process and the fact that they had actually got to see how chaotic it can be to be an entrepreneur. They had got to see a reality that the business plan literature did not say so much about. They had also got to see the complexity of creating knowledge. As one student put it:

The road has been made as we have been walking along it. It has been unclear where we should head.

The table below shows that two thirds of the students would have taken the course again, with all the knowledge they now have about the course, while one third would not have done so.

Table 24: Students: Would you have chosen the course again with the knowledge you now have about the course? (N=41)

Answers	Percent
Yes	62.5
No	37.5
Total	100.0

9.9 Discussion of findings from FRAM-Gründerlab

The process between the entrepreneurs and the students is an example of a complex process. FRAM-Gründerlab is one process, with nine sub-processes within the main process. I have only described some situations from the meeting in order to illustrate the process.

The first is that there was a difference in the wishes from the various entrepreneurs. Some of their wishes, such as finding investors or designing a web-page are very concrete. Even if they were concrete they needed re-thinking. I do not regard that the students should try to find investors. There are actors in the region which can find investors and there are companies that can design web-pages. What kind of knowledge university should and should not develop

should be specified in advance in courses like this, and not be part of a discussion between students and entrepreneurs.

Cogeneration of knowledge does not mean that university can fulfil every kind of wishes that is specified by a company. Cogeneration of knowledge implies that there must be dialogue where the wishes from the industry are discussed against the specific kinds of knowledge a university can offer. When this has been done and the actors from university and industry agree that this is what they want to do, then they can start the knowledge creation. The actors from industry must also acknowledge that the knowledge that is created in a process can be critically. Unveiling of tacit knowing and taken for granted knowledge can be hard to acknowledge.

The second finding is that the cogenerative phase lacked an organizational design. The students were not prepared for the meeting with the entrepreneurs. This finding is similar with the finding from the Master's thesis in Industrial Management.

The third finding is that in FRAM-Gründerlab I observed the difference between espoused theories and theories in use (Argyris and Schön 1996).⁵⁰ I have tried to convey this in the description, but I must admit that it is hard to describe this kind of processes with words, as Polanyi (1966) put it. The entrepreneurs said that they wanted something concrete out of the process with the students, such as a web-page or market research, but when they were challenged to say more about their idea and their needs, and why they wanted the students to do it, they had problems in expressing themselves clearly. The entrepreneur that produced feed for fish farming had a PhD in the topic, and she had worked for years with the development of the feed, but still she had problems in expressing herself. There can of course be other reasons why she had problems with this, for example that she did not share her knowledge with the students, but one explanation is that a part of her knowing how had become tacit. She was an expert in her field, but had problems in talking about it. The staff member that intervened in the process did not identify this as tacit knowing. He used another concept, the product market matrix, to solve the challenge.

⁵⁰ Cf. the discussion in chapter five.

Also the entrepreneur in the catering business had problems with explaining his knowledge (knowing how) to the students, but he admitted to himself that he had to try to communicate his knowledge to the students, and that he had to use time with the students. He therefore spent his time with the students because it was the only way of getting the knowledge he wanted from the students.

The students were not trained to identify tacit knowing and the difference between espoused theories and theories in use. The students were trained to generate data in the form of facts. Identifying tacit knowing takes time, and time was a scarce resource in FRAM-Gründerlab, but I think that many of the students realised at the end of the course that they had acquired a kind of knowledge in the meeting with the entrepreneurs that they would not have acquired on a traditional university course. It was a kind of added value from a real life process, which was hard to put into words.

9.10 Discussion and summary

I have compared two different knowledge creation processes: the Master's thesis in Industrial Management, and FRAM-Gründerlab. The questions I stated in the beginning of the chapter were:

- a. How is the knowledge creation process planned and organized?
- b. Who is participating in the process?
- c. How do the participants cogenerate knowledge together?
- d. What is the main outcome from the processes?

A closer look at the concrete knowledge creation processes shows that they were designed in the same way in the two courses: It was up to the students to find out how they should create knowledge with the companies. Neither the Master's students nor the Bachelor's students are trained in a cogenerative knowledge creation process. Their training has been in other areas, such as generating data and analysing them. But still it was assumed that the process would start instantly when they met. Neither the students nor the entrepreneurs were prepared for this part of the process. The entrepreneurs had expected that the students would create knowledge for them, when they had presented their idea. The students could not generate knowledge without the entrepreneurs and the latter had to state what they actually wanted the

students to do. The meeting with the companies showed that it was not as easy as that. They used a long time before they finally found out what they were going to do and how they should do it. Some students reached this point but many did not reach it at all. That some of the companies were satisfied with the outcome from the process is not a result of the design of the process but of other conditions, such as motivated students with knowing how in fields that matched the company's needs. Both Bachelor's and Master's students demonstrate the same behaviour. They want to create knowledge *for* the companies by using their theoretical knowledge. They see the company as an object they can get information *from* and as an object they are going to deliver knowledge *to*. They take it for granted that this is the only way of creating knowledge, that knowledge is created *for* someone in society, not *with* someone in society. This taken for granted knowledge is nothing else than tacit knowing. It is so deeply embedded that it is assumed to be *the* way of creating knowledge. The companies are seen as objects in the knowledge creation process; they are not seen as subjects that the students can engage in a cogenerative process with. However, the companies, for example the two ICT companies mentioned in the Master's course, show that they want a more cogenerative approach. The reason is probably because they work in this mode with their customers and suppliers. They see it as natural for them to also work with AUC in this mode; which seems to indicate cogenerative knowledge creation, but AUC is only offering Mode-1 knowledge creation. This finding should be followed up in a further research process.

I have used the model I developed in chapter five to analyse the process between the companies and the students. The model was designed for this purpose. It differentiates very clearly between the different phase of a process and the outcome of a process. I have tried to follow the model when I have structured the text in this chapter. The outcome in the form of data, information and theoretical knowledge is easy to identify. The development of knowing how is not so easy to identify during an intense process as FRAM-Gründerlab. However, there is no doubt that the students and the entrepreneurs generated knowing how from FRAM-Gründerlab. It would have been interesting to see what specific kind of knowing how they developed. Such a study would have required a different design than FRAM-Gründerlab.

I have not been in a position in this study where I have used the model to design a process, but the model is designed with elements from action research models that are currently in use in the Norwegian working life research tradition. The critical element is more my own knowing how in using the model in practice.

10. The challenge of organizing cogenerative knowledge creation processes

The time has come to round off the discussion. The main research question I stated in the introduction chapter was:

1. *How is knowledge created in the agora between a regional university and regional actors?*

As a way of illustrating and illuminating my main question I have presented data from knowledge creation processes in the agora between Agder University College and regional actors in the Agder region. In relation to the study of the processes in the agora I asked the following three more concrete questions:

- a. *Why* is Agder University College challenged by regional actors? I wanted to find out who is challenging Agder University College. I wanted to find out which ideas and/or theories that they are using to challenge the college with.
- b. *How* are knowledge creations processes in the agora organized and planned by Agder University College? I want to map the processes in the agora. I also wanted to see how the different processes between Agder University College and regional actors are organized, and who is participating in the processes. I also wanted to study some processes more in depth, and see how they create knowledge together.
- c. *What* main forms of knowledge are created in the different processes?
Theoretically I have differentiated between codified outcome and knowing how and tacit knowing. I also wanted to see if it is possible to identify the main forms of knowledge created in the different processes.

I started the discussion in the introduction chapter by saying that university is challenged. Nowotny *et al.* (2001) argue that a new mode (Mode-2) of knowledge creation is emerging in society, and that this Mode-2 knowledge creation is challenging university. The argument from the authors is that linear transfer of theoretical knowledge and technology from university to society is no longer sufficient. A new legitimacy of university is emerging. The new legitimacy demands that university must collaborate with actors in their host regions. In many countries and regions there have been different means established to improve

collaboration between university and regional actors and especially with industry, such as establishment of science parks and offices of collaboration (Brulin 2004). Both Nowotny *et al.* (2001) and regional development theories such as the regional cluster concept, Triple Helix and RIS approach black box the knowledge creation process in the agora between university and region.

My argument is that action research is an alternative approach that can contribute to opening up the black box of knowledge creation between university and region. In order to do so, it is important for regional universities to develop their *knowing how* in *cogenerative knowledge creation processes* in the agora between university and regional actors, such as industry. I have defined the agora is an abstract concept that denotes the meeting between people from university and the region, whose aim is to solve a concrete challenge or a problem that has been formulated. I discussed different kinds of theories developed by action researchers and I created an analytical model and a typology with four kinds of processes. The model consists of the following elements: participants, planning and organization of the process, and cogeneration of knowledge, which is the concrete knowledge creation process between the actors in the agora. The typology has the following four kinds of processes: Strategically organized processes, management organized processes, collectively research organised processes and individually research organized processes.

I used the model and the typology to structure the presentation and analysis of the data I have generated from my study of knowledge creation processes in the agora. My study has resulted in data that illuminates how the different processes are unfolding today. The processes I have analyzed have demonstrated diversity. The agora consists of many different knowledge creation processes: some are small, some are big, some are ad hoc organized and some are regularly organized and last for a long time, some are reported in the media while others are not so easy to identify. I will first present a summary of my main findings, and then discuss them against the theoretical framework in my study. The findings are:

1. The Competence Development Fund of Southern Norway has been important in the challenge for Agder University College. The Competence Foundation has also supported Agder University College with money for the process of becoming a university. The Competence Foundation has been a key actor in the challenge to AUC.

2. There has been a close relationship between the Competence Foundation, specific industries, called regional clusters by the actors in the discourse, and NHO⁵¹.
3. The challenge from the Competence Foundation and specific industrial actors is that AUC should participate more with the specific clusters. The argument is that AUC should contribute to the development of the specific industries.
4. There have been cluster studies of the ICT industry and the maritime industry in the region. There seems to be a taken for granted knowledge that there are other regional clusters in the region beside the ICT and the maritime cluster. However, there have not been any cluster studies done that confirm the existence of other clusters. Consequently there is a lack of theoretical knowledge about possible weak and strong sides of the potential clusters and a lack of knowledge of how Agder University College can contribute to the development of the clusters. In chapter seven I have called this single loop learning. The actors in the regional discourse have not questioned each other's beliefs. The discourse has only resulted in the correction of actions, as there has not been any new knowledge created. The actors in the process did not manage to change from a single loop to a double loop learning process.
5. The challenge from the regional actors has resulted in some changes in AUC. The regional discourse has resulted in both strategically and management organized processes, and changes in the organization of AUC, such as the re-location of the Centre for Entrepreneurship and an appointment at the university college director's office. The discourse is not only a change in dialogue and the words used, but a real change in work organization at Agder University College. Even though there has not been a consensus based dialogue, or a dialogue with a "good language" (Gustavsen 1992), the dialogue has resulted in change processes in the university college.
6. In the regional discourse there is the belief that AUC has not participated much with regional actors in knowledge creation processes. The response to this belief depends on what is meant by Agder University College. Does it mean that AUC participates in strategically organized processes, in management organized processes, in collectively research organized processes or in individually research organized processes? The problem is that this participation is not easy to observe and map exactly, because of its diversity and temporariness. Despite the problem of mapping, my conclusion is that knowledge is created in many different processes between Agder University College and

⁵¹ NHO is the abbreviation for the Confederation of Norwegian Business and Industry.

regional actors. There is a diversity of processes. The most extensive processes are between students and regional actors.

7. The processes between Agder University College and industry mainly involve companies located around the university towns of Kristiansand, Grimstad and Arendal.
8. Judged against the model I created in chapter five, and which I used to describe and analyse the processes, the actors responsible for the organizational design of the processes, pay attention to both the participants and the organization and planning of the process. However, the cogenerative element receives less attention. The two analytical phases in Greenwood and Lewin's (1998) cogenerative action research model have not been employed. Lack of fulfilling employing these two central criteria for the knowledge creation process can explain why the processes I have studied have been chaotic and why the knowledge created has been more trivial than I expected, such as in FRAM-Gründerlab, or that disciplinary knowledge was reproduced in the Thematic Process: cf. chapter eight, strategically organized processes.
9. The regional role of university has so far been interpreted through top-down initiatives, such as strategically organized initiatives and management organized initiatives. In the case of AUC the latter kinds of processes involve mainly the Faculty of Technology and Science. They are mainly technology and discipline oriented.
10. Otherwise there is little involvement of researchers from the university college in interpreting the regional role of AUC. This role so far in AUC has been interpreted as a management role which involves some actions with actors in the ICT industry and the oil and gas industry in the region. The top-down processes have not connected much to bottom-up research organized processes in the university college.
11. The establishment of regional foundations, such as the Competence Foundation has stimulated the establishment of several centres in Agder University College. These are bottom-up collective research initiatives, which offer both education and research to the regional actors. However, they have not been operative very long. It is therefore too early to say if they can be a part of Agder University College's regional role.
12. Knowledge creation is mainly interpreted as a process of creating knowledge *for* someone, and not *with* someone from Agder University College. It has not been possible to identify a cogenerative approach, to knowledge creation processes, with the exception of the two ICT companies that demanded a more intense and close process with the Master's students. Even new organizational structures, such as the Centre for Entrepreneurship, which has been established with the aim of collaborating with regional actors and teaching

students in entrepreneurship, do not pay much attention to cogenerative knowledge creation processes.

13. It has been hard to classify the outcome from the knowledge creation processes besides my main differentiation between codified outcome and knowing how.
14. I have tested out the model and the typology I created in chapter five. Both the model and the typology have been useful both in categorizing and in analyzing data from the processes in the agora.
15. I must also acknowledge that there is more to explore in the agora between a regional university and regional actors. This study is only a small attempt to open up the black box of knowledge creation between a regional university and regional actors.

I will now discuss the findings against the theoretical framework I have created. I will start the discussion within the core mission of university, which for Agder University College is education of students. For the time being the main task for Agder University College is education of students. I will therefore argue that the biggest improvement is to change the content of some of the programmes a little bit towards a cogenerative mode of knowledge creation. The headline for this discussion is collectively research organized processes.

Then I will discuss university from the approach of diversity of knowledge creation. Even if I have argued strongly in favour of the knowing how of cogenerative knowledge creation processes I will also argue strongly in favour of theoretical knowledge and its creation. The diversity of university should and must contain both dimensions of knowledge. The headline for the discussion is the following: University: An institution with diversity of knowledge

Then I will discuss university as an element in regional innovation systems. The argument is that the diversity of university is a strength that can be used in innovation processes and studies of regional innovation processes. The headline for the discussion is: university as an element in regional innovation systems

I have argued strongly in favour of action research as an alternative approach. I will reflect over action research as a method for studying processes. The headline is action research as a method for studying the agora inside out.

I will end the discussion with a compulsory discussion of the kind of studies I have done. The topic is simply further research. There is a need for both more theoretical knowledge and development of more knowing how.

10.1 Collectively research organized processes

The collectively research organised processes are at the core of the mission of university. For a regional university, such as Agder University College, it is education which is its most important mission. Education of the future workforce and education of reflecting citizens in society are important in today's society, with its wealth of information and theoretical knowledge. It is also important in a regional context. It is education that gives a regional university the possibility of participating with many processes in the agora with regional actors. This gives the students insight into practice. It also gives the students insight into a dimension of knowledge creation other than just experience at university. An education that is not linked to practice lacks an important dimension of knowledge, which is knowing how to cogenenerate knowledge with others. Both the nursing programme and teacher education have already been doing this for a long time, and other programmes are also designed to include practice, such as FRAM-Gründerlab and the Master's thesis in Industrial Management. However, it seems to be taken for granted that when people meet each other they immediately know what they are going to do, and how they are going to do it. It also seems to be taken for granted that the way the students are trained in university is the best and the only way of creating knowledge. Both FRAM-Gründerlab and the Master's thesis in Industrial Management show that the participants in the processes used a lot of time before they found out how they should create knowledge together with the companies. The students are not trained in cogenenerative knowledge creation processes, but are trained as traditional researchers, which is the usual way of creating theoretical, disciplinary knowledge in university. When the students meet regional actors they take it for granted that this is the only way of creating knowledge. However, in their meeting with practice this way of creating knowledge is not sufficient.

This is not a unique phenomenon for Agder University College, but a more general one. For instance, Mintzberg (2004) argues that management education does not have a relevant connection to practice and the complexity of practice. The candidates do not learn to deal with

complex cases and the complexity of decision making in practice, which means the MBA candidates are not well prepared for their meeting with practice after their education.

There is a need to educate the students in how they can cogenerate knowledge with regional actors. Cogenerative knowledge creation is the element that connects the participants' different kind of knowing how together in a process. The ICT companies that were participating with the Master's students wanted a cogenerative knowledge creation process. Cogenerative processes are well known among action researchers, but action research is not well known in university or in society. However, there is one study that is well known in university, and which prepares students for the meeting with regional actors: the nursing programme. In this programme the action or the practice period, as they call it, is an integral part. During the nursing programme theory is connected to action. As one of the interviewed nursery school teachers put it:

The theoretical knowledge is put into practice through the action. We differentiate between theoretical knowledge, skills in doing action, and reflection after the event.

In developing the nurses' skills from a novice level to a more advanced level the students start by practising on dolls and continue practising on each other before they are allowed to deal with patients. This means that the students are trained in very many different actions such as making a bed with a patient in it, taking someone's pulse and temperature, giving injections and so on. When the students are in practice the practice advisor always first demonstrates the specific action for the student. When the advisor is quite sure that the students can manage the action, they are allowed to do the action on the patient under supervision from the advisor, and in agreement with the patient.

Right before the practice period the students are gathered as a group with the staff, where they reflect on the approaching practice period. The first day in practice the students meet the practice advisor, who introduces them to the real work situation, during which the students are given more and more responsibility. During the practice period the students have regular meetings with staff from Agder University and the practice advisor, where the students' progress is evaluated. The evaluation includes the reflection notes the students write throughout the period about their experience from the work situation, where they try to connect it to theory. The reflection notes from first to third year demonstrate a clear development in self reflection. During each practice period there is an evaluation half way

through and at the end. The purpose of the evaluation is to check whether the students have acquired a certain level of knowing in specific actions. The end evaluation is evaluated as a pass or a fail.

The example from the nursing programme demonstrates that there are programmes in university where students are trained and prepared for the meeting with working life. The training develops the students' knowing how in specific actions. The example shows that it is possible to organize an education where the training of knowing how is an integral part of the programme. There is no such training of engineers or economists. If the nursing programme can become more theoretical, then the Bachelor's and Master's programmes in, for example, economics and engineering could also be changed, to include cogenerative knowledge creation processes.

The nursing programme has in fact changed during the last year, and has become more theoretical and less focused on training specific actions. The change in the nursing programme shows that there are different tendencies concerning the mode of knowledge creation. The profession studies are in the process of becoming more theoretical, while other study programmes are being challenged because of their disciplinary and theoretical orientation.

The examples of the nursing programme, FRAM-Gründerlab and the Master's thesis in Industrial Management demonstrate that theoretical knowledge is not sufficient in a knowledge creation process. The students in FRAM-Gründerlab could not just take the business plan model they had been given during the lecture in the topic, and fill in information from the companies. They had to do a lot of other things before they could start on the work with the business plan. The knowledge creation process with the companies was of a different kind than a theoretical knowledge creation process. The nursing programme acknowledges that knowing how is different from theoretical knowledge. Also in society there is an emerging acknowledgement that the knowledge creation processes in companies are different from in universities (Gibbons *et al.* 1994; Nowotny *et al.* 2001). However, to get this acknowledgement embedded in university is not easy. The reason is that university is a diversity of knowledge.

10.2 University: An institution with diversity of knowledge

University is an institution with diversity in knowledge. There are different disciplines, such as mathematics, physics, chemistry, history, literature, religion, nursing, economics, sociology, geography, technology, medicine, law, to mention only a few. Each of these disciplines can further be divided into different sub-disciplines. Even a small discipline such as geography can be divided into economic geography, cultural geography and development geography. Each of these can further be divided into different areas of interest, such as cluster studies, national innovation systems or RIS studies. There is a diversity of approaches to the knowledge concept.

In the discourse about the legitimacy of university this is not among the hottest topics. Rather it seems to have been forgotten in the discourse. In the interview round in Agder University College that I had with the public relations manager we asked the interview subjects how they defined knowledge. In the beginning I usually asked the question, but after some interviews the public relations manager started asking the question. He was searching for a common answer that could be used to create a clear and distinct profile for Agder University College. However, each interview brought us farther away from a common definition of knowledge. At the end of our interview round he acknowledged that it was not possible to create a clear and distinct profile for Agder University College based on only one interpretation of knowledge. The common core was the diversity of knowledge. This diversity is one of the characteristics of a university. Seen from the perspective of a formal organization where the aims, strategies and organizational structure are assumed to be clear and distinct, this diversity is interpreted as fragmented organization, as some of the interview subjects in AUC did. From a management perspective, which views the organisation top-down, the diversity or fragmentation can be interpreted as a weakness with an organization. However, a university is not a formal organization viewed from the perspective of knowledge. The diversity of knowledge is one strong side of university. It is the strength that gives university the necessary force to create new knowledge and renew university as an institution for knowledge creation. Without this strength university would lose its ability to create new knowledge. This strength is found in collectively organized research processes and in individually research organized processes. This strength is not necessarily a part of the strategically organized processes or the management organized processes. The latter two processes are for example driven by the aim to create a clear, distinct and uniform profile for the organization; such as

the aims formulated in the Strategy Plan. A university can never speak with one single voice when it comes to knowledge, and should never do that. A matter can always be interpreted from different perspectives and approaches. A university with a diversity of approaches to knowledge creation is the best way to ensure the freedom of knowledge. A university with a diversity of knowledge is the best way to ensure that knowing how can be further developed.

An approach based on knowing how as a distinct way of creating knowledge has a place in university beside all the other approaches to knowledge. The best way to develop knowing how in university is to encourage researchers to participate in cogenerative knowledge creation processes in the agora, and to build a critical mass of researchers that can teach the students this kind of knowledge.

10.3 University as an element in regional innovation systems

A university with diversity in knowledge can also have a role to play in regional innovation systems. In chapter seven I said that the challenge for Agder University College was a kind of Triple Helix between specific industries and the Competence Foundation. The challenge was timely and justified. It has initiated a change process in the university college, and at least some actors have become more conscious of the necessity of the regional role of the university college.

The relationship between Agder University College and the other actors was not based on consensus about the regional role of AUC. Industry and the Competence Foundation each had their opinion about the role of university and so did the rector. It is still not clear what the regional role of AUC is. The Triple Helix concept is very general in its approach to the role of university. It just specifies that university is an economic actor. However, university is much more than an economic actor. It is an institution for the diversity of knowledge. However, the Triple Helix concept does not see this kind of nuance, and the model is not nuanced enough to be used in more detailed analysis.

The theoretical inspiration of the Competence Foundation is the regional cluster model (Porter 1998). However, the regional cluster model does not discuss the role of university. The cluster model is based on the economic dynamics between companies. It is only the regional

innovation systems model that explicitly discusses the role of university and the role of knowledge in regional development. In the RIS model the role of university is regarded as important, but university is only one of several actors in the system. The RIS model not only focuses on the formal relationship between the elements in the model, but focuses also on all kinds of relationships. Nilsson *et al.* (2007) argue there is reason to believe that the informal relationships represent the most creative elements in the regional innovation systems. If this is true, the diversity of university has a role to play in a regional innovation system. One way to do this is to stimulating the diversity of knowledge in university to participate in the agora by use of economic incentives such as from the Competence Foundation and from internal incentive systems in university. Formal, top down agreements are ok, but they have to be connected to bottom-up initiatives from researchers.

I have argued in favour of cogeneration of knowledge, but this does not mean that I am against cluster studies and studies of individual firms. Cluster studies are necessary in order to obtain secure information about a possible cluster in a region, to obtain information about strong and weak sides of a cluster and of possible strong and weak sides of a regional innovation system. In Agder there is a lack of this kind of studies, which can be used as a background for a discussion of how university can contribute to the further development of industry.

The regional role of university is not created once and for all but is probably recreated the whole time as more and more knowledge from the processes between university and regional actors accumulates in the region, as knowing how and tacit knowing do in the different individuals that have cooperated in this kind of knowledge creation processes. It will take time to find out how a regional university can contribute in the knowledge creation processes with regional actors.

10.4 Action research as a method for studying the agora from inside-out

I have used an action research approach in my study. My main strategy was to follow processes between Agder University College and regional actors over a certain period of time. When I started my study of Agder University College in the second half of 2003 there was not

much discussion about Agder University College's regional role. The regional actors were at that point more concerned about the possibility of transforming Agder University College into a university. A study done in the fall of 2003 would have given a snapshot of AUC that is quite different from the image I have created in this study. It would have been an image of a university college with ambitions of becoming a university. It would also have been an image of a university college which was mainly concerned about the education of Bachelor's degree candidates. And it would have been an image of a college without any specific regional strategies. Even in the fall of 2004 this would have been the main image, but at that point some of the changes had started. The regional actors had started challenging the college and the process of answering the challenge had also started. Without the flexibility an action research approach gives, I would not have spotted these change processes.

Without an action research method, which encourages the researcher to follow processes from a bottom-up and an inside-out approach, I would not have participated in either FRAM-Gründerlab or with the Master's students in Industrial Management. A system analysis, which assumes that university is a formal organization, done top-down, would not have spotted the diversity of processes with the regional actors.

Action research has also helped me to consider my own reflection processes and see them in the light of the reflection processes in the agora. They have helped me to question my own taken for granted knowledge, and take a new round to see if there are other possible interpretations. I must confess that, at the beginning of my study, I acknowledged knowledge as a product, i.e. as an entity or a substance that could be codified and easily transferred to other people for a useful purpose. I was not so much concerned about the many facets of the knowledge concept, but was more concerned about the organisation of university-industry relations. My focal point changed during my first interviews with personnel in university and in industry. The reason for this change was that I had one question: *What is knowledge?* The question was one of many questions I used to ask. I thought it was natural to have it in my interview guide, since knowledge and university in many instances are synonymous. Also in industry knowledge is said to be more important than ever. If knowledge is so important, then it should be possible to give a clear cut answer to my question, I thought. So, initially the question was more a check question, at the end of my interview guide. However, my expectations were wrong. I was given a lot of different answers, which confused me. As a researcher I have been working with knowledge construction for many years, but I had not

been concerned so much about the concept myself. I had to acknowledge that I have taken the concept for granted. After this acknowledgement I started to search for an answer. During my search, or expedition, through Agder University College and the Agder region, I found that I was not the only person who had been taking the knowledge concept for granted. There were several of us. My search process led me to acknowledge that the question could be formulated in another way: *How is knowledge created?* By reformulating the question in this way, I acknowledged that knowledge is created and constructed in processes between people. Knowing is knowledge in action. My study is therefore also a study of a change in my interpretation and understanding of the relationship between knowledge and university. It is a change from a question of what knowledge and university are to how knowledge and the notion of university are created, interpreted and changed during a knowledge creation process.

You never know when an action research study is finished. I have now reached a point in my work where I can say “now I am done”, but the processes between Agder University College and regional actors continue. As I was writing this last section, I received an E-mail from the research director in the college, asking me to contribute in the strategic organised process *Regional Cooperation*. The E-mail demonstrates that there are ongoing processes in the college. The process of definition, interpretation and re-interpretation of the regional role of Agder University College has just begun. It will be a continuous process that will last for many years. Many new initiatives and changes will be launched in the coming years, and the processes I have described will soon be history. Even though this is the end of my study, the story about Agder University College’s interpretation of its regional role continues.

As an action researcher I have participated in processes with regional actors and researchers from AUC. If I were challenged to give some advice for the further processes in the agora I would emphasize these steps:

First, start a reflection process about the knowing how that the researchers have gained from cooperation with regional actors. The aim of the process could be to improve the study programmes towards a more cogenerative mode. One simple way to do this is to invite students that have participated in such processes to share their knowledge with the researchers. Invite the persons in the companies that have participated with students. Do not invite directors or managers that do not have this kind of knowing how. The aim of these cogenerative processes is to consider the one common experience students, researchers and

companies have: the experience from participation with each other. Make this a routine each year to invite all those that have participated in cooperation processes to reflect together over their common experience. Use the suggestion from the process to change the study programmes. Let talk be followed by action, so that the regional actors can see that the cogenerative process is improving with each year.

Second, share this knowledge with other departments and faculties. This implies that the researchers that meet each other must be willing to share and cogenerate knowledge with each other with the aim of improving their study programmes. This can be done as sharing of knowing how from those that have knowledge from these processes, such as the nursing programme, teacher education, the Centre for Entrepreneurship, the Master's programmes in Industrial Management, Information Systems and ICT. This will then be a transdisciplinary action in the spirit of the Strategy Plan.

10.5 Further research

This study has been an inside-out and bottom-up approach of knowledge creation processes in the agora between a regional university and regional actors. It has been more demanding to do such a study than I thought. Participating in processes takes a lot of time. Many of the processes I have participated in can be labelled as ordinary social processes, as meetings between people. The outcome from such processes can be of importance for those involved in such processes, but is not necessarily worth reporting back to the academic community. This can be a weakness with my own reflection process that I have not managed to interpret the processes satisfactorily. It can also be so that the processes I have participated in are more common and general between university and regional actors than I think. May be it is so that these kinds of processes actually are the dominant picture, and that the so called success stories from other universities in other regions are exceptions to this rather dull image. They are success stories which are used to make a profile of a successful university, but actually it is only a handful of researchers and people from industry that have collaborated and made a breakthrough. I do not know, but I want to know more about both processes and the outcome from processes between actors in university, such as management and researchers, and actors in society, such as industry, the public sector and the civil sector. Both management and researchers can be further differentiated into different kinds of management and different

kinds of researchers and their knowledge. Agder University College is of course one possible university to study more in depth. But an even better possibility is to compare different universities in different regions in Norway, Scandinavia, Europe or the US.

There is a lack of comparative studies of universities with an inside-out and bottom-up approach. There is a lack of studies that critically examine knowledge creation processes between university and regional actors from a comparative approach. I would therefore argue in favour of comparative studies of research milieus and industry, done inside-out and bottom-up.

In the theory chapter I have used a lot of time to discuss the knowledge concept. I must confess that I have not managed to explore the outcome from the knowledge creation processes between university and regional actors in a satisfying depth, such as the nuances and diversity of the knowledge created, the quality of the knowledge, and the critical aspect of knowledge. There is a need to discuss further knowledge creation in the agora from this perspective.

I must acknowledge that I have not managed to explore in depth the relationship between the organizational design of a process and the different kinds of outcome from a process. The SECI model (Nonaka and Takeuchi 1995) argues for a specific relationship. However, the data I have generated has not given me enough information to say anything useful about this relationship. I regard this relationship as a topic for a research project in the future.

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