

Professional development for inclusive and adaptive education: Lesson Study in a Norwegian context.

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Abstract: This article presents findings from a study examining teacher talk in the early and late phases of a 4-year project in a Norwegian elementary school where Lesson Study was used as a method for professional development. The study focuses on inclusive and adapted education and aims to explore the changing beliefs about student needs and the adaptations teachers made to meet these needs. To this end, the study applies content analysis to audio recordings of teachers planning meetings.

Findings show development in how teachers understand themselves and their work in ways that can contribute to education that is more inclusive and adapted: 1) an increased awareness of student needs paired with a growing trust in students' ability to participate in the lessons; 2) more trust in teachers' own ability to influence student learning and development and; 3) a growing view of teaching and learning as a social enterprise where the active participation of all students is identified and used as a lesson resource.

Keywords: Professional development, inclusive education, adaptive education, Lesson Study, student needs

1. Introduction

Schools and teachers have a significant influence on the lives of children and youth. They are responsible for student acquisition of subject knowledge, but also for students' personal development and wellbeing. Because the inclusion of students with diverse educational needs in mainstream education has become a guiding principle in policy (UNESCO 2009), these responsibilities are characterized by the multiple complexities teachers face working with diverse groups of students. Teachers are expected to meet the diverse needs of their students, but also to do so in ways that do not marginalize students by treating some differently (Florian 2019). For many schools, this will imply restructuring teaching and adapting lesson planning to suit all learners. This has proven to be demanding, with reports indicating that many teachers do not feel prepared enough to tackle the challenges that are a characteristic of inclusive classrooms (OECD 2018).

Because increasing inclusion improves learning for all students, initiatives to develop inclusion must involve all teachers and the regular school system. This will often necessitate a change in school culture, and a shift in teacher mindset (Hart 2004). Professional development is mentioned as a requirement for implementing inclusive education (van Miegheem et al. 2018). This study explores the use of Lesson Study, a model of professional development where teams of teachers collaboratively plan, conduct, observe and reflect on the lesson, with the explicit goal of improved student learning (Lewis 2009).

While inclusive education includes all students, it is somewhat paradoxical that most studies on inclusion focus on students with different disabilities and special needs (e.g., Messious 2017 review where 82 % of the studies were in this category). Furthermore, research on professional

development tailored to contexts of inclusive education is typically studied from a disability perspective (Waitoller and Artiles 2013, Woodcock and Hardy 2017, Amor et al. 2019). According to Woodcock and Hardy, there is a need for research into forms of professional development that “encourage a positive and productive disposition towards the learning of *all* students” (2017, p. 53).

This study presents results of a 4-year professional development project using Lesson Study in a Norwegian elementary school with a diverse student group. Norway has a long tradition of inclusive orientation and a low rate of segregated students with only 1 % of the students attending special schools (Nes, Demo and Ianes 2018). The study explores the development in teacher understanding and actions relevant to inclusive and adapted education: understanding of student needs and adaptations to meet these needs.

2. Theoretical framework

2.1 Professional Development

Professional development of teachers can be described as systematic efforts that result in changes in attitudes, beliefs, classroom practices, and improvements in student learning outcomes (Guskey 2002, Borko 2004, Darling-Hammond, Hyster and Gardner 2017). It is a broad area that has shifted into what Darling-Hammond and Richardson (2009) call “a new paradigm”. This is characterized by teacher collaboration, focus on student learning and provision of opportunities for hands-on learning, all of which are sustained over time. Messiou and Ainscow (2015) suggest that teacher development should take place within the classroom, connect to and build on the expertise available within the school, create cooperative spaces, and engage teachers in developing a common language of practice. Desimone (2009) describes research consensus about a) content focus, b) active learning, c) coherence, d) duration, and e) collective participation as characteristics critical to improve teacher knowledge and practice, as well as for increasing student achievement.

This study draws upon elements from Kelchtermans’ (2009) framework for understanding teacher professional development. This framework emphasizes that understanding or influencing of teacher actions is a result of identifying and analyzing their thinking. Kelchtermans holds that through their careers, teachers develop a personal interpretative framework containing a set of cognitions and mental representations. The framework determines how teachers look at their job, give meaning and act within its context. The framework guides their interpretations and actions but can also be modified by experience. According to Kelchtermans (2009), the personal interpretative framework has two interwoven domains: *professional self-understanding* and *subjective educational theory*. The term self-understanding refers to the dynamic and biographical understanding teachers have of their professional self. The term subjective educational theory refers to the personal system of knowledge and beliefs about education that teachers use. One of the components of self-understanding is task perception: the teacher's idea of the tasks and duties that constitute doing a good job. Task perception includes beliefs about what constitutes good education, moral duties, and the responsibility teachers have, to ensure that students are treated justly. Research into what teachers think is good teaching has evolved to focus on two broad categories: student-centred (reflecting constructivist views of teaching) and teacher-centred (reflecting a transmission model of teaching) (Fives, Lacatena and Gerard 2015).

2.2. Professional development with Lesson Study

Lesson Study, originating in Japan, constitutes a systematic approach to professional development that embodies many key aspects of effective professional development (Willems and Van den Bossche 2019). In Lesson Study, teams of teachers work together in communities in order to develop

their practice. At the core of the method is the research lesson, where the teacher teams collaborate to formulate goals for student learning and long-term development and plan this lesson in detail. The teacher teams then conduct the lesson with one team member teaching and the others observing in order to gather evidence on student learning and development. Afterwards, the team meets to reflect on and discuss the evidence gathered during the lesson. It is then possible to improve and teach the lesson again in another class. In the last stage in the Lesson Study cycle, all teams meet to share and discuss their learning, providing opportunities for collective learning and development of the school culture (Lewis 2002).

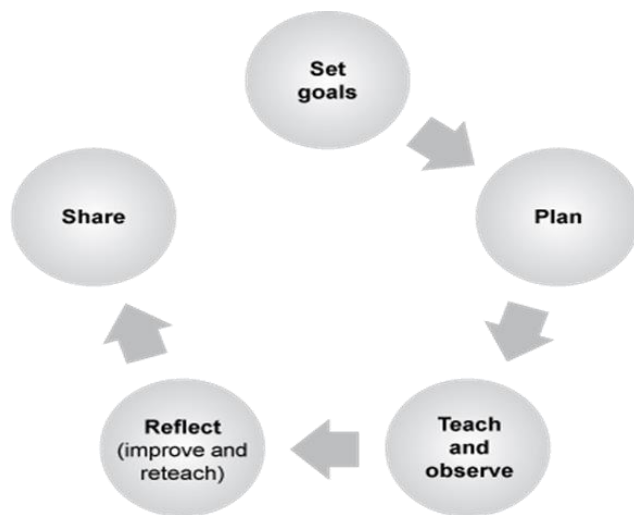


Figure 1. Outline of a Lesson Study cycle (adapted from Lewis 2009)

Ainscow and Sandill (2010) explain that much of what teachers do during a typical lesson is carried out at an automatic, intuitive level, involving use of tacit knowledge. It is through sharing experiences with other colleagues and articulating and reflecting upon their personal interpretative framework, that the possibility for professional development arise.

Timperley and Alton-Lee (2008) found that focusing on how teaching affects students is the central professional development activity that promotes teacher learning. This focus includes activities promoting authentic experiences, examining student understanding and learning, and discussing personal theories of practice and their implications. A central feature in Lesson Study is teachers observing live classroom lessons to explore how teaching affects student learning (Lewis, 2009). These lessons will embody the teacher teams' ideas about good instruction. By observing different students, the teachers get access to the ways students think and learn from the lesson. This strong focus on student thinking and learning is central to Lesson Study. However, the goal of Lesson Study is not primarily to produce good lessons. It can be described as a research process intended to produce teacher learning to improve future instruction (Stigler and Hiebert, 2016).

Research has shown that Lesson Study can help teachers shift their focus from teaching to learning, and to develop greater insights and responsiveness to student needs (Ylonen and Norwich 2013, Xu and Pedder 2015, Schipper et al. 2017). Schipper et al. (2020) also found that Lesson Study increased teacher self-efficacy in engaging all students. Xu and Pedder's review of Lesson Study research (2015) determined that the processes that most contribute to teachers' professional development were the development of new understandings through collective reflection and that teachers in this process must renegotiate and transform perceptions and beliefs. Dudley (2013) emphasized the importance of the discursive process of Lesson Study as a mediator for teacher

learning. The degree of professional development depends on the quality of collaboration between teachers; both conflict and excessive politeness can be a hinderance (Xu and Pedder 2015).

2.3. Inclusive and adapted education

Inclusion is defined by UNESCO (2003) as an ongoing process of addressing and responding to the diversity of needs of all children with a conviction that it is the responsibility of the regular school system to educate all children. This is the ideological basis for inclusive education. Inclusive education is interpreted in two very different ways: as full or radical inclusion claiming that all student needs should be accommodated in general arrangements, or soft inclusion, acknowledging that some student needs require special arrangements (Norwich 2002). A challenge implicit in a soft understanding is attending to individual differences while actively avoiding the marginalization of learners or exclusion of groups (Pantić and Florian 2015).

One way of handling diversity in the classroom is through adaptive teaching: defined as adjusting lesson planning and teaching to the diverse needs of students (Vogt and Rogalla 2009). Adaptive teaching is generally appreciated as a collaborative process taking place within a sociocultural context (Corno 2008, Beltramo 2017). Inclusion implicitly emphasizes the social aspect of learning by viewing the community of students as an important resource for learning. This implies that inclusive adaptive teaching does not mean individualization of instruction, but rather creating what Corno (2008) calls a *middle ground* by targeting ways to bring disparate groups of students together so they can benefit from the same instruction. It also implies a holistic framework where students' academic and social needs are met, and where schools take responsibility for students' academic, emotional and non-cognitive development (Leicester 2008).

The beliefs teachers have with respect to student needs is a key element in developing inclusive education (Avramidis and Norwich 2002, Pantić and Florian 2015), because these beliefs affect teachers' commitment and ability. Teachers must believe they have the power to make a difference in what and how children learn; this is what Hart (2004) describes as the idea of *transformability*. This category of beliefs is sometimes referred to as *contextual*: believing that student needs are caused by situational demands, such as the ways schools are organised and the teaching methods in use (Skidmore 1999, Messiou and Ainscow 2015). In the alternative to contextual beliefs, difference is attributed to individual abilities, putting the most significant factor for student learning beyond the teacher's control. This narrows what possibilities teachers see for the students and lessens their own feeling of responsibility, both negatively affecting how they respond to student needs. Perceiving student needs as an expression of inherent deficit is shown to lower teacher expectations and lead to a lessened feeling of teacher responsibility (Rubie-Davis and Rosenthal 2016). Transformability implies trust from the teacher, both in one's own ability to meet student needs, as well as trust in the student's competence and willingness to participate in meaningful ways (Goddard, Tschannen-Moran and Hoy 2001). Differences have also been found in how teachers respond to student needs. An "individual abilities view" is associated with targeted interventions aimed to remediate the shortcomings of individual students, while a "contextual view" leads to more generalized initiatives with collective development of classroom practice and curriculum and student-centred instruction (Jordan, Glenn and McGhie-Richmond 2010, Skidmore 1999).

Greater insight and responsiveness to student needs and the shift towards focus on student learning shown in Lesson Study research would lead to an expectation of better adaptation skills in teachers. Schipper et al. (2017, 2018) examined whether Lesson Study enhanced competence for adaptive teaching. They found an improvement in teacher awareness and the ability to identify students' different needs, but also that almost half of the teachers found that it remained difficult to adapt

their teaching to these needs. Their 2018 study included observations of teacher behaviour change but observed no change in adaptive behaviour. The difficulties in handling diverse needs in mainstream classrooms are reported by several researchers, e.g. Woodcock and Hardy (2017) who note that teachers found it excessively demanding to plan for the needs of all students.

This study explores how Lesson Study contributes to professional development focusing on inclusive and adapted education. It identifies and analyses aspects of teachers' personal interpretative framework (Kelchtermans 2009) relevant for inclusive and adaptive teaching. It does so by examining teacher talk during lesson planning at the start and end points of a four-year development project.

The research question is:

-How do teacher beliefs about student needs, and the way they adapt practice to meet these needs, develop through the Lesson Study period?

3. The study

The current study is part of a larger project that takes place in one elementary school in mid-Norway, which has implemented Lesson Study for professional development. The concept of inclusion has influenced policy in Norway, where mainstreaming has been an overarching political goal since the 1970s (Ogden 2014), and inclusion became part of legislation and curriculum from 1997 on. The national Education Act states that all children in Norway have the right to attend a regular class in their local school regardless of abilities and needs, and the main way of organizing education is through a one-track system with the regular classroom as a common arena for all students. Norwegian teachers are used to working in teams, although their collaboration has shown to be characterized mostly by practical issues, with few features that have potential to develop teaching (Junge 2012). According to the Norwegian Education Act, local school authorities have responsibility to ensure that teachers have relevant and updated competence through a system for in-service professional development. The 2017 national strategy for competence development (Ministry of Education and Research) pointed to decentralised competence development as one of the most important interventions.

3.1 Context

The participating school is of medium size, with approximately 370 students from grades 1 to 7, located in a suburban/rural area. As Norwegian legislation gives all students the right to attend their local school, the school has a diverse group of students. Students' educational needs are mainly handled through support in the regular classroom, with some use of smaller groups on occasion. In a baseline study conducted before starting the Lesson Study work, there was a positive attitude among the teachers towards inclusion. Some expressed pride over what they had achieved with respect to inclusion, and many wanted to improve their practice. None questioned the principle of inclusion or wanted more segregation in the classrooms. However, some found inclusion difficult and demanding and many wanted more guidance and support in better adapting their lessons for a diverse student group. The project period was four years, with all teachers and school leaders involved. Two researchers from teacher education were active in the project, with facilitation for the team leaders prior to each Lesson Study cycle. The teachers completed nine cycles during the project period.

The above implementation followed Lewis' Lesson Study-handbook (2002). Facilitation had a bottom-up-perspective with the researchers as equal partners and the school management and teaching staff as owners of the project. The Lesson Study-cycles had various overarching themes that the teachers could include in their planning. Some topics were initiated by the school leaders, others came from the teaching staff. Examples of topics were writing across subjects, appreciative teaching and interdisciplinary teaching. Most of the topics were general and the teaching teams themselves decided how they wanted to use them in their planning. For some themes, the school leaders provided lectures for the teaching staff ahead of the Lesson Study-cycle. Throughout the period, the teams had great autonomy to choose the focus based on the needs they themselves experienced in their classes. By participating, the school wanted to develop the quality of teaching in general, so more inclusive teaching was not a stated goal of the project. However, it was decided that all students, including those with special education needs and Norwegian as second language, should participate in the research lessons. Teachers and researchers have treated all information about students confidentially.

3.2. Sample and data collection

The participants in this study were four teams from the first two Lesson Study cycles and four teams from the last two. The teams were interdisciplinary, and the participating teachers covered all subjects, with special education teachers in some teams. Teacher experience was mixed, ranging from newly educated to 30 years' experience, with an average of 10-19 years of experience. Each team consisted of 3-5 participating teachers.

The study is based on analyses of audio recordings from these eight teacher team meetings, where they planned the research lessons. The raw data that form the basis of the analyses consists of a total of 24 hours of audio recordings; four meetings from the first two Lesson Study cycles in 2015 (11.5 hours) and four from cycle eight and nine in 2018 (12.5 hours). Each team of teachers was given a digital audio recorder and they managed the recordings themselves. The school leader gave the recordings to the researchers involved with the larger development project at the end of each Lesson Study cycle.

3.3. Analysis

The analysis of the transcribed sequences followed qualitative content analysis (Mayring 2014, Schreier 2014). To explore development, the analysis provides both qualitative and quantitative results. From the raw data, procedures for a selective protocol (Mayring 2014) was followed. Guided by the research question and the theoretical fundament, sequences of talk concerning student needs and adaptation to needs were sorted out as units of analysis. These sequences were transcribed verbatim. First, all utterances concerning student needs and adaptations to meet needs were registered and counted. Then, a coding scheme for each group of utterances was developed. The subcategories are a combination of theory-driven and data-driven and have been developed through a process of progressive summarizing (Schreier 2014). This sorting and structuring with a goal of combining inductive and deductive categories can be described as a loop: formulating, reducing, revising and reformulating categories. The coding scheme was piloted on parts of the material, then revised and modified before coding the material as a whole. Part of this process was to find what Mayring (2014) calls anchor samples: typical utterances that can illustrate the character of the category. The transcriptions from 2015 and 2018 were first coded separately, following the same procedure. According to Mayring (2014), registration of how often a category occurs may give additional weight to its meaning and importance. Content analysis gives opportunity for quantification in order to explore the usage of certain words or content (Hsieh and Shannon 2005),

and frequencies in the categories were counted in a summative analysis. The coding scheme then served as a starting point for further data exploration (Schreier 2013), examining patterns in the subcategories and comparing findings from 2015 and 2018. In the final stage of analysis, the findings regarding student needs and adaptations were coded inspired by concept coding (Saldana 2016), with the intention of conceptualizing more abstract and general codes that describe overarching traits in the teacher’s development.

4. Results and discussion

In this section, results from the analyses are presented and discussed. With respect to student needs, the order is: presentation of the developed coding scheme and results from the summative analysis, followed by results from the analysis of subcategories, and then discussion of the findings. The same structure is followed for the adaptations (coding scheme and summative results, subcategory results, findings). Presentation and discussion of the codes related to overarching development as they emerged from concept coding (Saldana 2016) completes this section.

4.1 Student needs

Results:

The process of coding started with the first main category, *student needs*. Student needs were coded according to two aspects: what type of needs the teachers talked about and what underlying beliefs the statement represented. *Type of needs* were first coded in two different subcategories: according to *academic needs* and *behavioural needs*. When coding the 2018 material, a third category became evident: needs concerning the learning environment. Going back to the 2015 transcripts, a closer look revealed a few statements that could be placed in this category. Beliefs of needs were coded in two subcategories: whether they represent an individual or contextual belief. Next, statements belonging in the different categories have been counted in order to explore differences in frequencies between 2015 and 2018.

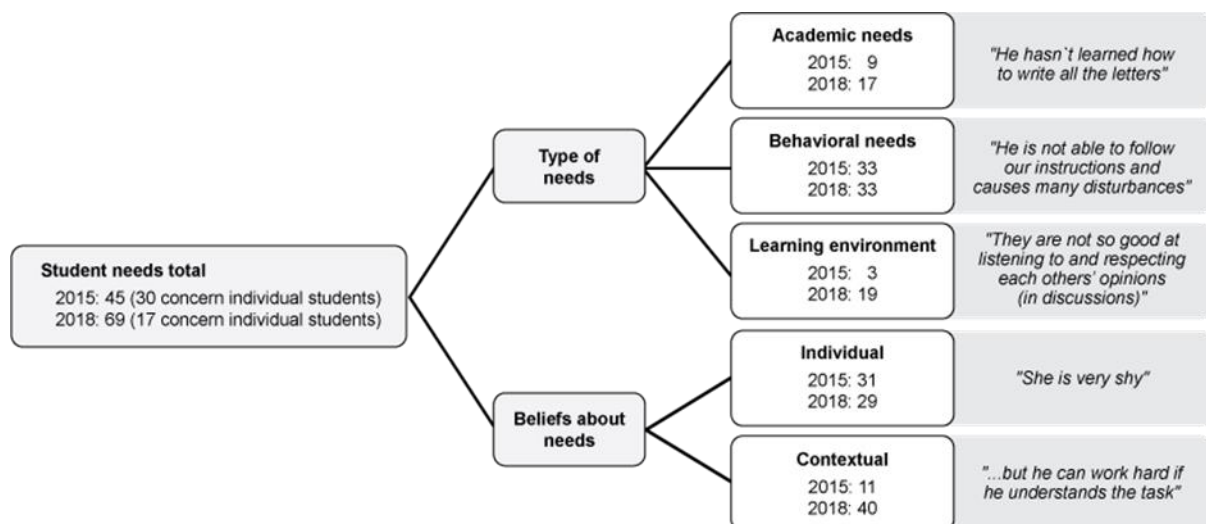


Figure 2. Coding scheme Student needs

Figure 2 show that the total number of statements concerning student needs increased from 45 in 2015 to 69 in 2018. Furthermore, we see that there has been a marked decrease in statements concerning individual student needs (from 30 to 17 over the same period). Behavioural needs predominate in both the 2015 and 2018 statements, while there are more statements about academic needs in 2018 (from 9 to 17). There has also been an increase in statements about needs concerning the learning environment in the classes, increasing from 3 to 19. Regarding what beliefs the statements represent, there has been an increase in statements with an underlying contextual belief (from 11 to 40). Parts of this change is due to the learning environment needs, where almost all of these were talked about as skills students needed to practice and thus coded as contextual.

Next step was analysing the content in the different subcategories. The main part of statements about academic needs concerned the schools' focus themes during the different periods. In 2015 the theme was writing across subjects, in 2018 it was developing students' academic language. The 2015 statements concerned students struggling with writing, and one typical statement is "He is not able to write down what he is thinking". The main part of the academic needs in 2018 concerned students lacking knowledge about academic concepts necessary for the different subjects. Many of these needs concerned students with Norwegian as second language, and a typical statement is "There are so many words that they don't know". Some needs concerned student (learning)ability at both points in time, but the 2015 statements largely characterized needs described as innate and stable traits. Statements like "Are we going to have a strong and weak group now?", and "This is very good for the weak students" are representative. The concepts of strong and weak students were widely used in all teams and no one questioned these utterances. These descriptions were, in some cases, combined with negative expectations: "We know the answer to this" (which of the students will get into trouble) or "She will not benefit from this; that's the way it is". In 2018 there were only a few utterances using terms like "weak" and "strong" in referring to student ability, and no expressed negative expectations to students.

Statements about behavioural needs dominated both in 2015 and 2018, and the majority of these concerned students lacking motivation and ability to get started and keep working in the lessons. In 2015, these statements mostly regarding individual students: "she is not able to get started without help". And some named students that represented possible chaos: "He needs something concrete to do, otherwise he will destroy the whole lesson». Some named students who were described as shy: "she is very quiet". There were a few instances describing the need as situation- dependent: "These boys can do well if we manage to get them going", but needs were mainly talked about as stable traits. In 2018, the statements most often regarded groups of students: "the ones we know often lose their concentration" and "Some students are afraid of talking in front of the whole class". There were few instances of student naming and many cases of teachers explicitly taking responsibility for the student needs: "What makes them fall out? Anything we do?" They describe incidents where students show mastery and describe how demands in the situation lead to the unwanted behaviour: "it might be difficult for some to contribute if they work on their own".

In addition, a new category emerged while analysing the 2018 material: needs concerning the learning environment in the classes. This theme was central in many of the teams' conversations. Looking back at the 2015 transcriptions, three statements were found that could fit into this category, but these were found in one team only. Needs concerning the class learning environments were mainly about students lacking the skills needed for teachers to use methods that require a more active student role. Lack of independence and initiative were the two areas most often mentioned: "They don't have strategies on how to find out for themselves, but immediately ask us teachers" and "Why has it become like this, that they do not trust themselves?". In addition, there was mentioning of the need for students to practice skills needed to master different types of

learning methods: “They are not so good at listening to each other’s opinions (in discussions)” and “They have trouble taking responsibility when working in groups”. In all these instances “they” seemed to refer to the whole class.

Discussion:

A soft understanding of inclusion implies meeting student needs (Norwich 2002), and a precondition for this is that teachers discover what needs their students have. The increase of statements concerning student needs (from 45 to 69) is in line with other research showing that professional development with Lesson Study increases teacher awareness and insights into student needs (Xu and Pedder 2015, Schipper et al. 2018). Statements in the conversations both in 2015 and 2018 related to many of the same themes: students lacking motivation, perseverance and ability to concentrate, and being anxious. But there is development in how the needs are talked about. One important factor concerning beliefs about student needs is that teachers must believe they have the power to make a difference in what and how children learn, what Hart (2004) describes as the idea of transformability. Statements about student needs from 2015 mainly referred to the needs as innate and stable traits, while they in 2018 more often contained nuances referring to demands in the situation or skills not yet learned. The teachers described situations where students succeeded, and frequently asked themselves what they could do differently for the students to manage. This implies a move towards a view where contextuality and transformability are increased; where the teachers believe they can have an impact by changing the situation or teach the students the necessary skills. Negative expectations for some students found in 2015 are absent in the 2018 conversations. This supports a change away from an individual view about student needs which has been found to be associated with lowered expectations (Rubie-Davis and Rosenthal 2016). The 2018 material reveal an increased interest in the learning environment among the teacher teams. They wanted to involve the students more actively in the lessons but experienced that their students lacked the necessary skills. This represents a turn towards a more holistic view (Leicester 2008) where they take responsibility for a wider range of student needs and development. Many of the needs in the learning environment category regard development of student aptitude (Corno 2008), for example when one team suggest that they, together with the students, want to develop strategies for what the students can do if they are insecure (other than asking the teacher).

4.2 Adaptations

Results:

The second main area for coding was *adaptations* to meet the different needs teams had talked about. (All ideas mentioned for adaptations are part of the material, not only the ones being realized in the research lesson.) Adaptations were first coded in two main categories: concerning *behavioural* and *academic needs* which each were divided into two subcategories: adaptations for behavioural needs either through external control or support for self-regulation, and adaptations for academic needs either for individual students or as part of the general planning. Finally, statements belonging in the different categories have been counted in order to explore differences in frequencies between 2015 and 2018.

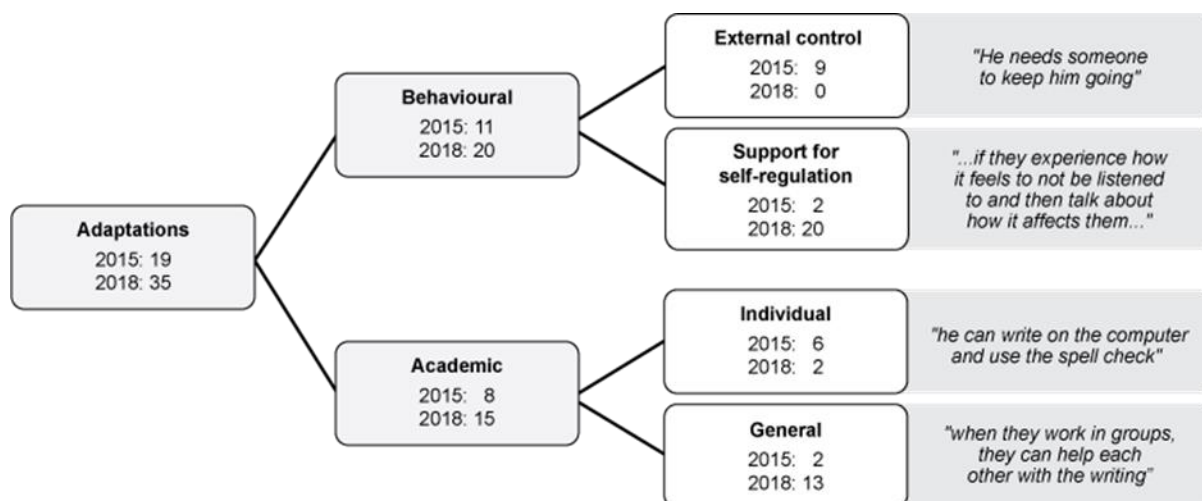


Figure 3. Coding scheme Adaptations

When it comes to adaptations, we see in figure 3 that the total number of ideas for adaptation has increased from 19 to 35. It is shown both in academic adaptations (from 8 to 15) and behavioural adaptations (from 11 to 20). The behavioural adaptations have changed from mainly focusing on external control from the teachers in 2015 to support for self-regulation in 2018. There has also been a shift from adaptations for individual students towards adaptations as part of the general lesson.

Next step was analysing the content in the different subcategories. The adaptations regarding academic needs largely fall into two groups: concerning the schools' focus themes and concerning learning ability. The first group of academic adaptations regarding difficulties with writing in 2015 and academic language in 2018. In 2015, the teacher groups provided different types of writing support for some students: sentence starters, writing templates, provide spelling aid and synthetic speech. Nearly all adaptations for writing were provided for individual, named students and planned after the regular lesson plan was finished. In 2018, many of the adaptations made intended to meet language needs. Visualizations were widely used, and teachers discussed how to concretize different concepts. One solution involved a class making a model of a medieval society, learning different concepts by making and talking about the models. There were also many discussions about students' existing knowledge, and that the teachers had to use words from the students' everyday language and build on that. Variations in teaching methods, including students explaining to each other, as well as providing different opportunities for students to use the new words were also widely mentioned. All these adaptations were planned along with and were integrated as part of the regular lesson. In 2015, adaptations concerning *learning ability* consisted of various kinds of differentiation: by dividing the students in groups by ability level and giving them differentiated tasks or learning goals. These adaptations were all characterized by giving the students regarded as "weak" something else, often combined with placing them together. In 2018, the character of adaptations focused on learning ability had changed; many of the teams made the learning tasks open, so that the students could differentiate themselves, or with an easy starting point, but with opportunities to develop more complexity in the tasks. Teams included more opportunities for student cooperation so that students could help each other. The 2018 adaptations were characterized by integration in the regular lesson.

Although the teachers spent as much time talking about behavioural needs in 2015 as in 2018, there was an increase in adaptations in this area in 2018 (from 11 to 20) and a greater breadth in what kinds of adaptations they talked about. In both years, the talk centred on students with low

motivation and difficulties with keeping on task. The adaptations found in 2015 were changes in how the classroom was organized (to separate students who often disturb each other, or to seat an anxious student next to a student she is comfortable with), to stay close to named students in order to help them get started and keep them going, and to control that students using computers as writing aids did not use them for other purposes. In sum, the focus of these adaptations was keeping control of student behaviour and maintaining their on-task activity through external control. In 2018, the adaptations to meet behavioural needs can be sorted in three categories:

-Making it easier to get started (designing the first part of a task to be easier, preparing some students so they get a lead, making tasks in group work in ways that make everyone in the group necessary and able to contribute)

-Using learning activities that they know engage many students (involving student activity, something practical, game-like activities, cooperation) or

-Making tasks meaningful for the students (the results are going to be used either by presenting to others, used in a parent meeting).

Cooperation in smaller groups was also mentioned as an adaptation for shy and anxious students to make participation less threatening. These anxious students could then talk on behalf of the group (shared responsibility) or discuss and present in smaller settings. All adaptations regarding behaviour in 2018 were directed towards making it possible for students to control themselves.

There was increased attention on the learning environment in the classes, with statements regarding needs in this field increasing from 3 in 2015 to 19 in 2018. Most adaptations in this area were with respect to different ways in which students could practice active learning skills. These include such things as practicing taking responsibility or leadership in group work, learning strategies for what to do if they couldn't get the job done or practicing working independently. There were suggestions that the students, together with the teacher, could make rules for how they wanted a discussion to proceed. The teachers also talked about what they had to do differently to make the students more independent: that they could give the students time to find out for themselves instead of immediately giving them the answer or give the students time to prepare before a joint discussion. Several teams discussed the role of teacher: that they needed to give students the opportunity to find out for themselves and allow them to experience uncertainty in order to learn to trust themselves. The teachers discussed that they may had to relinquish some of the control, giving students room to exercise self-control and become more actively involved.

Discussion

The teachers' academic adaptations are characterized by two different approaches. In 2015, individualized differentiation is seen as the main way to adapt to academic needs. This is consistent with what Skidmore (1999) found associated with an inherent ability view on needs: targeted interventions aimed to remediate the shortcomings of individual students. This type of adaptations can increase the differences between students, especially if combined with teachers having lower expectations of these students (Rubie-Davis and Rosenthal 2016). These adaptations might meet student needs, but possibly in ways that lead to exclusion and reduced learning opportunities (Pantić and Florian 2015). In Cornos' (2008) words, it shrinks "the middle ground". She claims that adaptive teachers aim to enlarge the middle ground by targeting ways to bring disparate groups of students in a class together so they can benefit from the same instruction. The 2018 adaptations are more in line with this thinking; they are integrated into the regular lesson, in ways that make it possible for all students to participate in the same activities. Another finding is that in 2018, the teachers show

more awareness of the diversity of students' prior knowledge. For instance, when the teachers talk about the academic concepts they want the students to learn, several teams discussed how to explain by using the students' experiences and everyday language.

When looking at behavioural adaptations, an extended view on reasons for why some students behave in ways that hinder learning is found. The 2015 adaptations in the form of external control implies a perception of disruptive behaviour as something innate and uncontrollable for the students themselves. This aligns with an inherent abilities view (Hart 2004). Adaptations like the ones found in 2018 carry a different implicit understanding: that some students can find lessons difficult, that some can find the working methods unmotivating or meaningless, or that activities in the lesson can be experienced as threatening for some students. This places the reason for student behaviour as dependent on the situation and as something the teachers have power to influence by making changes in the situation. This aligns with a transformability view on student needs (Hart 2004), and it seems that in 2018 the teachers have an increased understanding of their own potential to influence student behaviour and an increased trust (Goddard, Tschannen-Moran and Hoy 2001) in their students' ability and willingness to learn.

While the 2015 behavioural adaptations dealt with external control, the 2018 adaptations were directed either toward developing student self-regulation or making the work easier and more motivating. This can be understood as developing a more holistic view of teacher responsibilities (Leicester 2008). From efforts to merely control student behaviour, they have developed an understanding and strategies for planning lessons where students can more easily control themselves. This can be understood as an extension of responsibility into students' non-academic skills. The development towards a transformability and holistic view is also evident in the adaptations concerning learning environment that emerged in the 2018 conversations.

4.3 Lesson Study and development in teacher self-understanding

Assuming the research lessons embody the teacher groups' hypothesis about good instruction (Lewis 2009), changes in how they talk about student needs and plan to meet these needs can tell us something about development in their personal interpretative framework - their professional self-understanding and subjective educational theory (Kelchtermans 2009). The previously described results have been subject to concept coding (Saldana 2016) to find overarching themes that can describe the development in more general terms.

The first category of development concerns the teacher role and is labelled *extended responsibility*. Teachers seem to take responsibility for more aspects of student learning and development. This is especially evident in two areas: adaptations aimed at students' behaviour and adaptations aimed at developing the class learning environment. In 2015, the subject of adaptation was mainly students' academic learning, while in 2018 it was an extension to adaptations that covered a much broader set of development fields. This implies a development in the teachers' task perception towards a more holistic view of teaching where facilitating and supporting students' non-cognitive development is as critical as developing subject knowledge (Leicester 2008, Kelchtermans 2009). Essentially, this is teachers feeling that they have the power to influence student development in more areas than just the academic, and thus in the direction of transformability (Hart 2004). It can also be understood as a development towards more trust (Goddard, Tschannen-Moray and Hoy 2001) in teachers, both for their own potential to influence as well as in students' desire to participate and master in the learning situation.

The second category of development concerns view of learning and is labelled *from an individual towards a social view of learning*. We have seen that in 2018, the teachers turned their attention to the class learning environments and how community contributed to student learning. Teachers were concerned with how students could learn from, support, and motivate one another, and consequently used the idea of community as a resource when planning the lessons. According to Beltramo (2017) and Corno (2008), a sociocultural view of learning should be the basis of adapted education. This is evident through the changes in how teachers adapt to meet student needs. In 2015, this was mainly done through individualized and tailor-made interventions for named students, while in 2018 it was done through adaptations in the regular lesson that made it easier for all students to participate. The 2018 adaptations were more in line with the sociocultural view of learning, as they made adaptations that allowed all students to participate in the same activities. To use Corno's term, the teaches expanded "the middle ground" (2008).

The third category of development concerns the role of the student and is labelled *from students as passive recipients towards active participants*. In 2015, teachers plan as if learning is something that is transmitted from teacher to student. In this view, teachers are the driving force in the learning process and students are passive recipients. It is the responsibility of the student to stay calm and receive instruction, while teachers have a duty to control student behaviour. This corresponds to a teacher-centred view and a transmission model of teaching (Fives, Lacatena and Gerard 2015) where learning is something that is transmitted from teacher to student. This view of learning is found to be linked to an individual view of student needs (Jordan, Glenn and McGhie-Richmond 2010). In 2018, teachers were planning based on a more active student role, where the students' contribution to the lesson is important. Teachers were committed to developing the student aptitude skills necessary to bring the collective learning processes into the classroom. This reflects a pivot towards more student-centred teaching (Fives, Lacatena and Gerard 2015) and a growing view of learning as something students construct themselves through active participation. This approach to learning can also be linked to a contextual understanding of student needs (Jordan, Glenn and McGhie-Richmond 2010).

The development of how teachers understand themselves and their work is largely built through personal experiences (Kelchtermans 2009). Timperly and Alton-Lee (2008) found activities that promoted authentic experiences of how teaching affects student learning to be central to teacher learning. This is one of the core features of Lesson Study, and through the nine Lesson Study-cycles, the participating teachers have gained new experiences through observing how different students respond to the lessons and then discussing their observations with colleagues.

5. Concluding remarks

The aim of this study was to explore teacher professional development using Lesson Study with a focus on inclusive and adapted education. The participating teachers have through the four years planned, conducted and reflected upon nine research lessons together. According to Stigler and Hiebert (2016) the goal of Lesson Study is not primarily to produce good lessons, but to produce teacher learning that can improve future instruction. Many researchers point to shared experience and shared reflections as key to professional development. This study pays attention to development regarding inclusive and adaptive education and assumes that inclusive education is attentive to student needs and meet these needs by adaptations making it possible for all students to benefit from the same instruction. Based on these assumptions, the study suggest that the

participating teachers have developed their understanding of the students, themselves and their work in ways that can contribute to more inclusive and adapted education.

The teachers show an increased awareness of student needs and trust in the students' ability to participate in the lessons, they show more trust in their own ability to influence students learning and development, and they show a turn towards viewing teaching and learning as a social enterprise where the active participation of students is a resource the lessons can draw upon. They have also changed the way they make adaptations, from individualization to adapting the regular lesson and thereby attending to individual differences in more inclusive ways.

This study has explored inclusion, not from a disability perspective, but from a perspective where participation and learning for *all* students is the focus. Some key features in Lesson Study may have contributed to the shown development, as Lesson Study provides authentic experiences and the opportunity for shared reflection on how teaching affects student learning. The study suggests that Lesson Study can be a form of professional development suited for developing inclusive and adaptive education.

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