DILEMMAS OF STREAMING IN THE NEW CURRICULA IN NORWAY

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The paper describes aspects and dilemmas concerning streaming of students according to ability in an ongoing developmental project in a small town in Norway. The project is part of a governmental effort to implement the New Norwegian curricula plan "Kunnskapsløftet[1]". This new plan introduces streaming of students, which is new in the Norwegian school context. The data presented are from focus groups involving teachers in which ideological conflicts are identified.

INTRODUCTION

Norwegian schools are strongly influenced by ideologies associated with the principles of collective teaching and learning and equal rights for education. This is partly a curricular effect of 60-70 years of social democratic politics and striving for social and economic levelling, including the equal right members of society should have to obtain positions in society regardless of their parents' socio-economic status (Telhaug 2005). Hence at the start of the new millennium nearly 100% of Norwegian students are in public schools, all written plans (curricula) for all levels and for all disciplines all over Norway have the same form and function, there are no marks given before year 8, until 2003 permanent and structural streaming based on marks or ability was not allowed, and there is no choice for specialisation in disciplines or branches before year 12 (of 13). Sources of this strong and nationally shared egalitarianism can be traced in the political and cultural history of Norway.

Braathe and Ongstad (2001) have located and problematized some major ideologies in mathematics education such as rationalism, activism, competitivism and 'autodidaktism' on the one hand and egalitarianism on the other, and asked how these are challenging the Norwegian egalitarian mathematics classroom. In 2001 Norway got a right wing government. One of the main tasks this government took on was to revise the curriculum plan for the school system from 1st to 13th grade. This new curriculum "Kunnskapsløftet", implemented from 2006 on, represent to some extent the same challenges, where solidarity and egalitarianism are in essence challenged by competition and inequality. This process can be traced to international trends connected to OECD's use of education as indicator for economic status for participating countries. This again has resulted in revised curricular plans in various countries (Grek, 2009). School mathematics is one of the subjects that have been used as such an indicator and is strongly influenced by these trends. The teachers of mathematics experience this in their everyday teaching as there has been a focus on the quality of their job. This focus has so far in Norway been negatively charged, especially for teachers in the primary schools.

The right-wing government decided to allow schools to organize the children into groups according to perceived ability, which had been forbidden by law from 1978 on. This was a major break with the egalitarian ideologies widely accepted in the Norwegian social democratic school system. It initiated many discussions among teachers and school leaders. This reform, together with a focus on the contemporary push in education for outcomes-based learning where students' progress is mapped against levels, led many schools all over Norway to leave the old system with heterogeneous classes as the organizing unit and to stream the students into ability groups. These groups are organized according to perceived ability in mathematics following standardized tests given to students at the beginning of the school year. The same groups are often kept in other subjects as well.

This breaks with earlier principles introduced in M74, the national curriculum for compulsory education from 1974. This provided a curricular framework ('rammeplan') in general and for each subject, a means for differentiation within a common, supposedly shared culture. In mathematics the quite open plans gave general guidelines for the teaching which enabled different students to work on different topics and levels, and at different paces and depths, within the same subject area. At the same time, all students took the same final exams at the end of grade 10 (grade 9 before 1997). A general critique of the framework plans from 1974, 1984 and 1987 by educators in mathematics, was that they were too open and non-specific. This criticism contributed to the more specific guidelines provided in 1997 for each school year as well as the definition of minimum levels of subject matter for the common final exam at the end of grade 10. However the framework ideals were kept in the sense that it gave room for individual differentiation, since all goals were formulated as areas that the students are supposed to work with.

Kunnskapsløftet breaks with this tradition and is the first curricular plan to be goal-oriented. It formulates the goals as "students shall know…". Differentiation becomes adjusted education, and allows for streaming of students from first grade on. The expressed intentions are still that all students shall reach the same knowledge goals and meet the same final exams at the end of grade 10.

CHANGE OF PRACTICE

The Norwegian government initiated and financed a program for developmental projects to support schools and communities in implementing Kunnskapsløftet. The program is called "Kunnskapsløftet – from words to action". Oslo University College took on such a project to strengthen the teaching and learning of mathematics in a small city near Oslo. The ongoing project has, through observing and working with teachers and groups of teachers in their classrooms, emphasised a communicative and exploratory pedagogy. Through activities and reflections, the teachers' awareness of students' learning and mathematical meaning formation are problematised. These reflections are intended as elements in strengthening and possibly changing practices of teaching and learning of mathematics in schools and classrooms.

All teachers involved were asked in spring 2009 to write a short report on their experiences in the project. These reports pointed at three elements that have influenced their practice in the classroom:

- More use of practical material (as illustrations, as representations, ...)
- More practical mathematics (as relevance, connecting to students' experiences, ...)
- Speaking more mathematically (both between teachers and students and between students, to put words to concepts and to give concepts meaning, ...)

The teachers also reported more self-confidence and freedom to improvise more and to let go of the textbook at times.

THEORETICAL ORIENTATION

The point of departure for understanding teaching and learning of mathematics in this paper is connected to how teachers create their own and collective understandings and mathematical meanings. Identification as a teacher of mathematics, through acting, or performing, as a teacher in mathematics, is closely associated with meaning making in mathematical contexts. Conceiving teachers' knowledge as part of a complex set of interactions involving *action, cognition and affect*, places teaching as a complex practice. A main perspective then is a view of teaching and learning as communication (Braathe, 2007; 2009; Ongstad, 2006; Sfard, 2008). Seeing mathematics and mathematics education as kind of communication will be to see mathematics and mathematics education as genres. I take the perspective that teachers involved in development projects like this are participating in different genres, kinds of communication, including mathematical genres, and are potentially experiencing different ways to act as a teacher. It is helpful to call this process 'learning'. This will be connected theoretically to seeing learning as semiosis in the field of teaching mathematics. This is consistent with seeing learning as communication. This shifts seeing development from a psychological to a semiotic perspective, thus locating developmental principles in the making of meanings. As I see learning, or developing of identities, as being positioned in communicational genres, I locate identities as dialogically situated in, negotiated and formed by genres, and so they can have many expressions dependent on the context. Identity can then be seen as dynamically combining the personal, the cultural and the social (Braathe, 2007).

Such an assumption can be researched by considering how constructions of meaning and understanding of knowledge of mathematics and teaching and learning of mathematics connect to historical, social and cultural frames. Developmental projects like this can open up possibilities for questioning dominant discourses on knowledge formation and forms of knowledge.

METHOD - FOCUS GROUPS

During communicative interactions, people use narratives to make their words and actions meaningful to themselves and others. They can be thought of as presenting themselves as actors in a drama, with different parts or "positions" assigned to the various participants. Positions made available in this way are not fixed, but fluid, and may change from one moment to the next, depending on the storylines through which the various participants make meaning of the interaction. Focus groups provide possibilities for exploring how knowledge, language and storylines emerge in given cultural and social situations. Barbour and Kitzinger (1999) argue that focus groups are an ideal method for exploring people's experiences, meanings, wishes and worries, and the method is well suited for exploring beliefs. When it comes to beliefs Putcha and Potter (2004) holds that beliefs are not some independent ideas that a person expresses in specific contexts, but are produced continuously and especially in situations where there are opportunities for discussions.

In June 2009 we conducted nine focus groups with teachers involved in the first two years of the project. The theme for these focus groups was the teachers' experience of change of practice during the two years. The focus group discussions have been analysed to identify discourses and positions. Our focus in the analysis is to identify constructions of meaning. We have been aware of power relations in the groups, both our own, and internal power relations within the groups of teachers. We have asked follow-up and contradictory questions in order to produce contradictions and disagreement, but also built on aspects that stood out as collective stories from several teachers. We have identified that some teachers had similar reflections on being part of a mathematics project like this, independent of their individual positions in the different schools. Some of these collective arguments are what we argue may be identified as aspects of dominant discourses. Hidden or tacit discourses allow some dominant aspects to create and legitimise particular ideologies in mathematics education. We have identified some of these as dichotomies, as nodal points in the creation of meaning (Braathe and Otterstad, in press). In this paper I will focus on one of these, the tension between differentiation in heterogeneous classes and adjusted education in ability groups.

THE UNITY OF THE CLASS VS. STREAMING

When the project started in August 2007 all the schools involved had already organised ability groups in mathematics in all grades. We were a bit surprised that this practise had been established so quickly, but the project took this as a premise and had no intention to interfere.

Research literature gives little support for the practice of streaming, yet this is a wide spread practice all over the world. Zevenbergen (2002) has used a Bourdieuian analysis, using field and habitus to understand why this practice is still so wide spread and why teachers so easily accept it. She raises questions as to why and how the field

of mathematics education supports the practice of streaming. Such support may not be overt, but can also be ideological, and hence less open to criticism.

> One reason why there is this support can be found in the dominant ideology in mathematics education where it is widely accepted that mathematics is hierarchical in structure (Ruthven, 1987). If it is perceived that there is a hierarchy in the complexity and demands of the discipline, then it would be logical that students can be mapped against this hierarchy. When this is coupled with the contemporary push in education for outcomes-based learning where students' progress is mapped against levels, there is a congruency between the teachers' beliefs about curriculum organisation, student learning and assessment. This enables teachers to justify streaming on the basis that students can be exposed to content that matches their levels of understanding. The hierarchy of learning is further supported through the belief that appropriate learning activities and scaffolding can be developed to move the students on to greater levels of understanding and competence (Slavin, 1990). While streaming may be seen as an anathema to good teaching practice, the ideology of mathematics being hierarchical, in concert with the levelling ideology of outcomes-based education reforms, creates an environment that reifies a learning hierarchy. In so doing, this supports the use of grouping students according to their achievement levels. This ideology provides the structuring practices through which teachers are able to organise curriculum and learning under the guise that the practices that they develop support student learning (Zevenbergen, 2002, p. 3).

I will argue that the field of mathematics teaching and learning in Norway to some extent adheres to the above described beliefs. Zevenbergen further uses the reflexivity of field and habitus to explain why this practice of streaming has become part of mathematics education habitus in many countries all over the world. Streaming however has not been part of the Norwegian habitus. This should create some tension in this reflexivity, and should be possible to trace in the focus groups.

The inputs during the project has been with a focus on communicative and exploring aspects of teaching and learning mathematics, and have problematised how the organization of teaching influences students' learning and meaning formation. This shifts focus from the abilities of individual students to the social and environmental importance for learning. This also challenges the beliefs described above, which to a great extent are underpinned by a "belief in the notion of an innate ability whereby the students' abilities in mathematics is the major reason for the performance in mathematics" (Zevenbergen, 2002, p. 4). In this way underachievement is seen as the fault of the student due to their innate propensity for mathematics rather than of social conditions or other factors.

Since Kunnskapsløftet has the same knowledge goals for all students, there is an underlying idea that all students in all ability groups should work with all topic areas. Therefore we asked about this.

> Teacher 1: Not all, like in the weakest group we don't do that

Teacher 2: That is the case in our team too. The weakest group is a little bit on the side .. works differently.

Teacher 1: In the next weakest group I try to follow some of the subject areas, but very selectively in the sense that I skip things like probability and things like that. I will not use too much time on that, it is much more important that we use more time on the fundamental so it becomes that I select what we have to learn.

The two teachers express the beliefs quoted above, and the result is that they select the mathematics for the student according to perceived ability. These teachers are working with students from 4th to 7th grade. This belief is challenged when they reflect on what kind of students they prepare for the lower secondary school where they will meet other teachers and also been given marks.

Teacher 3: In the lower secondary they are focused on "reality orienting[2]" their students because they will all meet the same examination. They probably mean that we pamper too much with them, that is what they say. … They have very short time and they shall through so much stuff and they are obliged to come through with all before the final exam. They are so extremely occupied by the exam and that the marks shall be fair, then all must have had the possibility to have learned. Then I think there must be an enormous gap for the weakest students. … They will fall off … will be all black in their faces and just fall through and experience a, I think, terrible feeling.

Teacher 2: Yes, but I think that is not only for the weakest.

Teacher 3: No, there is probably many, but of course for the weakest, they will not understand anything. They are good at streaming at the lower secondary, it is not that I am saying anything else, but they have to get through, they have a absurd demand on them, so much to cover.. they talk all the time of this reality orienting of the students.

Teacher 1: And I think for some of them, for some have been to some of the courses [referring to courses given by The University College during the project] with basic teaching and learning of the four arithmetic operations. So some of the teachers at the lower secondary that took part, there and then I think they saw the points and thought it was exciting, but then I think when they get back to their teams and starts discussing and … they get caught in..

Teacher 4: And then they hear from the upper secondary that their students are not up to standard and ..

We read a distinct division between us and them, the teachers in primary school and in the lower secondary, despite the fact that they are working in the same school which is a school for children from 1st to 10th grade. The dilemma created by the final common exam for all students and the practice in the ability groups of selecting only parts of the subject area for some students to be prepared in comes to the surface.

According to Zevenbergen (2002) this is part of the habitus established around streaming in mathematics education, and concerns the problematic of assessment. As these teachers communicate about the subject, their communicative positioning expresses tensions and uncertainty about the normative rights towards the students that this practice offers. It breaks with the egalitarian ideology that is part of the Norwegian habitus.

In another of the schools in the project these tensions have resulted in a retreat back to heterogeneous groups.

Teacher: We have decided to go back to heterogeneous groups from the ability groups we have had for some years. That was a major change…

Braathe: Can you say some more about that, why did you go back?

Teacher: It was..we did not think it gave any results and it destroyed the oral aspects of the mathematics that we were used to earlier. The groups became too homogenous and it..it was more students that fell down from the best group than it was the other way so..I felt that I missed very much someone to play up against, someone in the middle. [The weakest] were not used to be orally active in mathematics and I could not get a word out of them if I asked questions, they were not used to be in the lead so I found that it functions much better now when there are students from diverse levels in the group because there is always someone who dares to ask questions and say that they do not understand so it's much easier to start dialogs with the students and between the students.

Braathe: Is it consensus between you teachers at the lower secondary about this, or have there been some disagreements?

Teacher: There has more or less been full agreement, but it was perhaps worse to let go of the system for the one who had the best students. If I had had that group then it could also have been that I would fight hard for that it is a brilliant system, but after struggling with the middle and the lowest groups then..

Braathe: Hm..

Teacher: You only got the ones who did not function socially.. the classroom is supposed to be some social balance, that was totally crashed when you got all the ones who thought that mathematics were boring and did not bother to work with math to sit in the same classroom..

This teacher expressed himself on behalf of colleagues in this school's lower secondary department and he got full support in the focus group. We can hear his emphasis on the social importance of the classroom for creating good situations for learning and construction of meaning. He underlines the communicative and dialogic aspects of teaching and learning as a support for all students' learning. In the above utterance it is first of all the weakest students' learning that is emphasized, and the situations for the teachers having these groups. The teachers at this school, through

this consensus, reveal beliefs that see teaching and learning situations to be equally important as individual students' innate abilities. So the long tradition of not streaming in Norway, with the underlying ideologies of egalitarianism (Braathe and Ongstad, 2001), have so far established a habitus that brings tensions to the Norwegian mathematics classroom when it comes to ability grouping.

SOLIDARITY VS. COMPETITION

The examples presented from the focus groups can be read as if the project, with its focus on communication and reflection on classroom situations, has vitalised the collective discourses with strong ideologies associated with the principles of collective teaching and learning and equal rights for education. The tensions that the new curriculum has started have deep roots in the egalitarian ideology of Norwegian society. New right wing neoliberal challenges of streaming in the Norwegian school system, as well as the globalisation effect of international comparisons in the name of strengthening competitive ideologies, have met ethical resistance from the well-established habitus with its collective values of solidarity that most teachers themselves have experienced both as students and as student teachers. In this way the reflexivity of the field of mathematics education and habitus show tensions on both ideological and ethical levels among teachers of mathematics in Norway.

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[1] The official translation of the Norwegian name, Kunnskapsløftet, of this new Curriculum plan is "Knowledge Promotion". The name indicates a will to focus knowledge, indirectly criticizing former plans for focusing democratic and social aspects of schooling in Norway.

[2] This is a translation of the Norwegian word "realitetsorientere". This was frequently used by the teachers in the focus groups and is a signal of the break from the primary school to lower secondary where the students meets the marking system for the first time. There is a belief among teachers in the lower secondary that many students for the first time gets an explicit negative feedback on their work in mathematics at this moment in their school career.