

# Empowerment and Control in Primary Mathematics Reform – The Swedish Case

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*We explore the recent national reform from the perspective of primary teachers, using Bernstein's concepts of classification and framing and focusing especially on the teachers' experiences of policies of control and empowerment. Almost all the teachers participating in our study (n=41) relate positively to the reforms in general. Several empowering experiences are connected to the national examination in particular, while many teachers still experience the steering document as not especially helpful in guiding their instruction. There is a tension between the positive experiences of the control policy on the one hand, and worries about violating children's right to develop at their own rate based on their prerequisites.*

## **Introduction**

The assessment of students' achievements in mathematics has been in focus at international and national levels for several decades. The declining results of Swedish students' mathematical achievements in the assessments organized by the Programme of International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) have been used by the Swedish government as one argument for the recent reforms concerning mathematics. After a period of weak classification and framing (see Bernstein, 2000, and Harling, Hansen & Lindblad, 2008), during which schools and teachers had a great deal of space to decide both the mathematics content to be dealt with and the rate of instruction in the classrooms, the Swedish mathematics curriculum has now been reformed in order to offer teachers clearer guidelines regarding both content and knowledge requirements, already in the first three grades (Skolverket, 2011a). The reforms have already met with some criticism, due to the possible negative effects of measuring and the risk that the teachers' professional freedom will be restricted (e.g., Liedman, 2011).

Research suggests that the way curricular guidelines are implemented in the classroom is greatly influenced by teachers' experiences and views (e.g., Corey & Gamoran, 2006; Remillard, 2005). Hence, to understand how reforms are implemented and, on a larger scale, what influence the reforms have on teaching and learning, it is important to understand how teachers experience and relate to

them. This is true not least in Sweden, where the national curriculum has previously left substantial space for local interpretation and application.

In this paper we investigate the curriculum development and the implementation of the recent reforms from the perspective of primary teachers using Porter, Archbald and Tyree's (1990) definitions of two different curriculum policies, *control* and *empowerment*. Control refers to guidelines, tests and examinations that the schools and teachers are obligated to use, while empowerment refers to various strategies for supporting teacher professionalism. These two policies can coexist and interact, as will be shown in this paper. We found also Bernstein's theories on classification and framing (Bernstein, 1990; 2000) useful in our analysis. We begin the first section by a brief description of Bernstein's concepts and their relation to the two policy strategies defined by Porter, Archbald and Tyree (1990) as well as to the teachers' experiences of them. Then we analyse the recent Swedish developments using these concepts.

### **Curriculum development and the policy of implementation**

Classification refers to the relations *between* categories, and classification (both strong and weak) always carries power relations (Bernstein, 1990; 2000). *Internal* classification concerns the boundaries between different mathematical contexts within the subject, while *external* classification concerns the relations between mathematics and other subjects as well as everyday practices. In our analysis, the focus is on external classification. Framing refers to the control of communication in local interactional pedagogic relations. This control can be over the selection of the communication along with its sequencing and pacing, the criteria or the assessment (Bernstein, 2000). The *control policy strategies* (prescriptions of the goals, the contents, national examinations and school inspections) can be more or less prescriptive and lead to weak or strong external and internal classification with respect of the boundaries between various mathematical contents and between mathematics and other subjects, and framing concerning sequencing and pacing of the content as well as the criteria of the assessment. Teachers' *experience of empowerment* has to do with inclusion and participation in constructing and transforming the social order. Their experience of control refers in our study to expressions of restrictions of their professional knowledge. The teachers' voices are not only seen as individual constructions but also structurally determined.

The pedagogic practice in Swedish mathematics classrooms (grades 1-5) has obviously been relatively weakly classified and framed during the past two decades (cf. Herling et al., 2008). Before the recent reform, only very general goals for the fifth and ninth grades in compulsory school were presented. The fulfilment of these goals was monitored through national examinations, the first taking place during the fifth grade when the minimum pupil achievements were

tested. Hence, there was no instruction regarding the content to be covered in order to reach the teaching goals. Also, the boundaries between mathematics as a discipline on the one hand and pupils' everyday life on the other were weakened during this period due to the mainstream pedagogical trends.

*Invisible pedagogy* is characterized by both weak classification and framing. The integration of different school subjects as well as the emphasis on students' free choice regarding their learning activities and their rate of learning have been connected to invisible pedagogies (e.g., Fowler & Poetter, 2004). The strong emphasis on students' motivational aspects and the child's right to develop at his/her own rate in the Swedish context also indicates invisible pedagogies. The criteria for assessing children's performance might have been implicit and unclear to students and parents, and sometimes, even to the teacher. Research indicates that students whose parents have non-academic backgrounds even more disadvantaged by invisible than visible pedagogies (e.g., Bernstein, 1990; Morais & Neves, 2001; Lubienski, 2004). This development was also recently observed in the Swedish context, and has been used by the government as one of the arguments for the recent reforms (Wester, 2011).

The first steps (implemented in 2008-2009) of the current reforms were to define specific goals for the third grade and introduce national examinations assessing the achievement of these goals. The second step (implemented in 2011) was to reform the whole compulsory and upper secondary school curriculum. The new Swedish national curriculum can still be considered only a framework as it does not suggest textbook materials or teaching methods, lesson plans or tests. Instead, teachers can freely choose the textbooks they use, or choose not to use any textbooks at all (cf. Fowler & Poetter, 2004). In the new curriculum, there is also a strong emphasis on students' everyday experiences, which should guide the content dealt with in the mathematics classrooms (the word *everyday* is mentioned 23 times in the ten-page document).

Bernstein uses the concepts *vertical* (e.g. everyday common knowledge) and *horizontal* (e.g. subject knowledge) when explaining why attempting to weaken classification and framing in progressive forms of education, for example by introducing informal discourses, does not make the instruction more effective but rather the opposite. According to Bernstein, the vertical discourse of schooling is inevitably strongly classified but the essential characteristics can be "masked" from all or some participants, or made clear and explicit to all, so that all involved can understand it" (Bourne, 2004, p. 63). The blurring of the boundary between everyday knowledge and school knowledge has also been connected to invisible pedagogies (cf. Morais & Neves, 2001). Yet, finding alternative pedagogies is not unproblematic, as Bourne (2004) and Jablonka & Gellert (2010), for example, show.

Concerning the *policy of empowerment*, teachers had the possibility to comment on the suggestions for the current national curriculum while it was being written, if they were informed of this possibility and allowed time to engage in the process by school leaders. Other empowering strategies were also applied in the Swedish policy, like attempts to strengthen the teacher preparation programs, and professional development activities organized by various actors, in order to strengthen the effects of the recent reforms (see Johansson, 2010). In addition to national examinations, the fulfilment of the curricular objectives is also monitored by school inspections. Further, the municipalities (as school authorities) as well as the local school leaders can conduct other kinds of monitoring in their areas. Hence, both control and empowerment strategies are used, in order to create and implement the new curriculum (cf. Porter, Archbald & Tyree, 1991).

According to the National Agency for Education, the purpose of the national examination is “to support an equal and fair judgement and marking, to offer a basis for the analysis of the extent to which the knowledge requirements are fulfilled at school, school authority, and national levels”. Further, it states that “the national examinations can also contribute to concretizing the syllabuses and raising the goal fulfilment of students” (Skolverket, 2011b, authors’ translation). The national examinations have also a diagnostic purpose (PRIM-gruppen, 2011) and, hence, should enhance the *formative* use of the results. The notion of formative assessment has been used for several decades in many countries, and its benefits have also been in focus in the Swedish context during the past decade (see, for example, the National Agency for School Development, 2007). Formative assessment refers to the continuous cycle of observing, testing and improving instruction according to the observations and results of the tests. Swedish teachers can choose their own diagnostic materials, or can choose not to use written tests or diagnoses at all. The National Agency for Education offers material for the diagnostic and formative assessment of students, but there is no obligation for the teachers to use it. Consequently, no national control is exercised here so the extent and character of formative assessment can vary between schools and classrooms depending not only on the policy of the respective municipality and school but, above all, how important teachers consider the value of formative assessment with respect to both their own teaching and students’ learning.

### **Data gathering and analysis**

The explorative study presented in this paper is part of a larger project investigating the implementation of the primary level reforms in one Swedish municipality with a special focus on certain schools as cases. The municipality was chosen because of the ongoing cooperation project between the municipality

and our university. In the global study, the implementation of the reforms is studied from the perspectives of the mathematics developers<sup>1</sup> working in the municipality and the headmasters of the focus schools, as well as of the primary teachers and special education teachers at these schools.

In the present paper, we investigate the ‘voices’ of primary teachers and analyse the relevant parts of the data gathered during 2010-2011 through questionnaires and interviews. The first questionnaire, with both open questions and closed statements, was delivered (via mathematics developers and headmasters) to 32 primary schools (grades 1-3) in the municipality in focus in our study. Yet, we cannot be sure that all the teachers received the questionnaire, and even less that they were given time to respond to it. A total of 13 teachers (11 females and 2 males) responded to the first questionnaire in 2010. A shorter version of the questionnaire, with only open questions, was given to 28 third-grade teachers when they attended an information meeting organized by the municipal mathematics developer in 2011. None of them had responded to the first questionnaire and all of them (25 females and 3 males) responded to the questions in the short questionnaire. Further, semi-structured interviews were conducted with four teachers. The aim of the interviews was to explore some issues from the questionnaires more in-depth. The four teachers were chosen because they work in the schools that are in focus in our global study. All the teachers (41) who participated in our study had the qualifications needed for primary level teaching, but not all of them had the qualifications for teaching mathematics. Further, most of the teachers had more than five years’ teaching experience, but there were also some who had no experience of teaching but were to start to work this autumn (2011). Although about one-fourth of the primary teachers responded to our questions, we cannot claim that our sample is representative of all the primary teachers in the municipality. Still, the data we have obtained are rich and the analysis reveals several interesting items to delve more deeply into in further studies.

For this paper, we have particularly analysed the questions dealing with how the teachers relate to and experience the introduction of the goals and national examination as well as formative assessment. The questions we posed in both questionnaires and focused on during the interviews analysed in this paper are:

- Do you think it was positive to introduce goals and national examinations for the third grade? Motivate your answer.
- Has this reform somehow influenced your teaching, and if so how?
- How do you judge the mathematics knowledge of individual students?

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<sup>1</sup> The municipal mathematics developers are a part of the national developmental project initiated by the Swedish government in 2006. They have participated in the regional conferences organized by the National Centre for Mathematics Education (NCM).

- Have you been informed about your school's results in the earlier national examinations in mathematics?

Besides these questions, in the questionnaire directed at the third-grade teachers we also posed the following questions relevant to this paper:

- Do you consider that the new steering documents support you in planning and carrying out your teaching?

Besides these questions, the teachers had the possibility to talk about issues relevant to the study. The interviews were transcribed and the responses to the questionnaires were compiled before the analysis. We followed a qualitative data analysis but made some quantification where appropriate. The responses were analysed with respect of expressions connected to feelings of empowerment and restriction. In the next section, we offer several authentic expressions in order to make our analysis and transparent.

### **Experiences of empowerment and control**

We present the results by first describing and exemplifying the teachers' voices concerning the *goals and content descriptions* in the curriculum documents. Then, we focus on the experiences of *the national examinations* as well as formative assessment in general.

Almost all the teachers in our study declare that it was positive to introduce the new steering documents already in the third grade, and several statements show experience of empowerment rather than control. A number of teachers consider the new curriculum (Lgr11) clearer and more concrete than the previous one, but at the same time feel it is still quite open to interpretation, concerning both the knowledge requirements and the content. They state that it would be helpful to have examples of tasks in order to concretize the frame. One teacher criticizes the goals for defining only the minimal level, and fears that they do not encourage teachers and students to "strive ahead".

Yet, the majority of the teachers state that the steering documents in mathematics for the third grade support them in their planning and actual teaching. "It's good to have concrete national guidelines that create consciousness about what is important." They also experience that the new steering document has already influenced their teaching in certain ways; for example, they now feel more conscious of the goals and experience that the goals now steer their teaching. Several teachers state that they have started to work with LPP (local pedagogical plans) since the first reform was introduced. Other changes mentioned are "more mathematical discussions", "more teaching", "more work with elaborations with concrete materials and problem-solving", and "more practical work with weights, volumes, etc.". Hence, it seems that the policy of control has also empowering effects as it seems to enhance teacher professionalism.

Concerning the national examinations, the teachers state that they make it easier for them to work with their own assessment as it is now clearer what the students should know and achieve. Hence, the tasks in the national examinations help the teachers concretize the curricular goals: “We get a response about the level of teaching, whether we’re occupying ourselves with the right things.” One teacher even writes that there are good tasks and ideas for mathematics lessons in the national examinations. Concretizing the goals is also one of the purposes the National Agency has declared for the examinations. This can be connected to *stronger framing*, which makes the requirements of the pedagogic practice more visible to the teachers. Many teachers also state that there is a greater chance that pupils will be assessed equally (also one of the national purposes), although one teacher experiences that it is difficult to correct the examinations objectively. Some also state that they now think more about preparing the students to pass the examination, something that has often been pointed out as a limiting effect of testing.

Concerning the formative use of the national examinations, several teachers experience it as positive to conduct an earlier check as this lets them take action for more and relevant student training, and support students who do not meet the knowledge requirements. “We need an earlier check so that there won’t be unpleasant surprises later”, “It’s a good time to ‘measure’”, “It’s too late in the fifth and six grades”, “It’s good to have an earlier check, so we can get an idea about the child’s development”, “You get information about what students should train at more and what kind of support is needed.” Hence, the teachers experience a great deal of positive effects through this monitoring instrument.

Yet, the results do witness not only experiences of empowerment but also those of negative monitoring and restrictions on the teachers’ professional freedom. According to some teachers, the examination supports them in judging students’ mathematical knowledge on the one hand, but at the same time they feel that the examination becomes “a very big thing” to students and parents or that they have difficulty communicating the results to students and parents. “What I think is tough is saying to a cute little child who’s only 8-9 years old that he/she does not really fill the bill, you’re not good enough! Of course we don’t say it like that, but maybe between the lines and masked in a number of nice formulations.” They state that a teacher should “play down the test” so students and parents can understand that it is merely a diagnosis for the teacher and helps him/her obtain information about what should be practiced more in the mathematics classroom. Again, the teachers talk about the examinations in a formative manner. Some, although positive towards the examination, experience the tests as very time-consuming: “On the other hand, the teacher already knows before the examination who’s struggling. One might dedicate more time to these children instead of putting an enormous deal of time into preparing,

administering and correcting all these tests.” Hence, the teachers feel that the tests control their use of time and that they as professionals could do something better with the time they now spend on the tests.

There is also tension between the advantages of the tests, mentioned above, and how some teachers feel about the student’s right to develop at his/her own rate. “We say on the one hand that the children should have the possibility to develop at their own rate according to their own ability... all (children) are different. And yet there’s the idea that all children should have achieved at least this minimum level in mathematics by the end of the third grade. That feels tough to me!”, “If the child is to develop at his/her own rate, it’s difficult to be ‘mature’ and pass the national examination in the third grade”. Only two teachers do not experience the reform as positive at all, and refer to the problem described in the previous quotes. “No! It prevents the children’s individual knowledge process. To believe that all students should reach equally far at the same time is the consequence of a wrong thinking process”, “It’s forced me to adapt the students to the level of the national examinations, instead of adapting the teaching to students’ individual knowledge processes”. Hence, these teachers express a worry that the national examinations force them to violate the natural maturation of the child. There is also a worry about the limited time in the scope of the mathematics lessons to allow all students to be able to achieve the goals.

The results reported above indicate that the teachers tend to think about the national examinations formatively and that they expect school leaders to also take action with students who fail the examinations. “The headmasters become more willing to find resources in order to support students who fail to achieve the goals, because the result of the school is made visible”. Whether the school leaders use the results formatively at a school level (e.g., learn about the weaknesses and strengths of the pedagogies applied in the school and take action) seems to vary, according to the teachers. The majority of the teachers declare that they have not been informed of the school’s results in previous examinations. Concerning formative assessment in general, most of the teachers state that they use tests like ALP (from Gudrun Malmer) and Diamant (from the National Agency of Education), textbook tests and discussions. Several teachers only mention observations during the lesson work, and some state that they do not yet know how they will assess the students because their class is new for them. This shows that formative assessment is not a priority for all teachers in planning their teaching before the term starts.

The majority of the teachers do not have any experience of empowerment policies in the form of in-service education concerning the reforms, or extra time for studying and discussing the new steering documents before the meeting attended by 28 of the total 41 teachers in our study.

## **Conclusions and discussion**

The results of our study indicate that the primary teachers consider the introduction of the goals, content and national examinations for the third grade in general as something positive, something that strengthens their teacher professionalism rather than restricts it, assuming they are used in a correct manner (“not knocking out the students”). Hence, the strategies of control can be experienced by the teachers themselves as empowering the teacher’s professionalism. A great deal of positive expressions can be connected to stronger classification and framing, and making the requirements visible to teachers, school leaders, students and parents. At the same time, the expressions of negative monitoring are connected to worries concerning children’s right to feel that they are good enough and their right to develop at their own rate based on their prerequisites, a characteristic of pedagogic discourse that some researchers have connected to invisible pedagogies (see, for example, Fowler & Poetter, 2004). The national examination also entails some control over teachers’ time, which some teachers experience as restricting their possibilities to make professional decisions concerning where to concentrate their effort. On the other hand, the new curriculum still leaves a great deal of space for teachers’ interpretations and freedom to apply their teacher professionalism in their decisions, which many teachers also experience as problematic as they would prefer even more concrete guidelines about the content of their instruction.

Concerning the preparation of students to pass the examination mentioned by some teachers, there may be a danger of only working with similar tasks as those found in the examinations. The examinations only measure the minimal achievements and hence the goals of the instruction should be more extensive, as one of the teachers points out. The continuous formative assessment, which is not regulated at all, plays a substantial role in how the instruction is planned beyond the national examinations. The national examinations are experienced in a formative manner by the teachers. However, we do not know how this is realized at school level. There is no monitoring of the use of other kinds of formative assessment in the municipality, and our results indicate that there is a substantial variation between how teachers relate to it.

Neither the status of primary teachers nor that of primary teacher education is especially high in Sweden compared with certain other countries, and primary teachers seldom take part in the school debate at a national level. It is possible that one reason the teachers experience the reforms as generally positive, besides the clearer guidelines, is that the importance of primary teachers’ work has become more visible in society at a national level. We found the theoretical underpinnings drawn on Bernstein’s theories of pedagogical discourses fruitful for our analysis. Yet, more work is needed to illuminate the primary teachers’ role and positioning in the time of the recent reforms.

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