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SWEDISH UPPER SECONDARY STUDENTS' PERSPECTIVES ON THE TYPICAL MATHEMATICS LESSON

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Abstract: This paper presents a group interview study of Swedish upper secondary students' perspectives on the typical mathematics lesson. Students, from four demographically different schools, constructed a collective synthesis of their many years' experience of mathematics classrooms. Transcriptions were subjected to a constant comparison analysis, which yielded a consistent lesson structure. This comprised a period, known as a *genomgång*, during which teachers 'go through' something, followed by periods of individual work from the book. While there was some variation in the manifestation of both elements of the lesson, students were remarkably consistent in their summary of the typical lesson structure.

Key words: Sweden; upper secondary students; mathematics; lesson structure, group interview

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1. Introduction

Culture permeates every aspect of education but its influence frequently goes unacknowledged. Those whose lives are dominated by school – cleaners, caretakers, kitchen workers, ground staff, parents, administrators, teachers and, of course, students – can be forgiven for not noticing, because culture is ordinary (Williams, 1958) and those immersed in a school's day-to-day activities typically do not see the uniqueness of those experiences. But they are consequences of culture's influence on every aspect of how schools function. Culture explains why, for example, some systems expect students to attend school in uniform and others do not. Culture explains why some systems group their students by ability, gender or religion and others do not. It explains the timing and length of the school day and whether all days are structured according to central diktat or local preference. It even explains variation in the architecture of school buildings. It explains decisions with respect to the deployment of generalist and specialist teachers and, in the case of the latter, whether teachers remain in their classrooms while students come and go or students remain in their classroom while teachers come and go. It explains the length of compulsory education and the number of years allocated to its primary and secondary phases. In short, culture explains the affordances and constraints a system places on children's learning.

From the perspective of mathematics, culture influences the ways in which it is presented in classrooms and the behavioural expectations of participants within them. It determines the nature of textbooks and the manner of their production and deployment. It determines the amount of time given to the subject annually and expectations of an optimal lesson length. It determines how homework is integrated into the programme of teaching and learning and, of course, it determines the extent to which problem solving is integral or peripheral. In other words, every aspect of mathematics didactics is culturally normative and, in light of such matters, it is surprising how little is known about how mathematics is experienced by millions of learners across the world. In this paper, drawing on upper secondary students' interview narratives, we address two objectives. The first is to elicit students' perspectives on the typical Swedish mathematics lesson. The second is to examine the efficacy of group interviews as an approach to eliciting those perspectives. But first, we consider the literature on the culturally determined nature of the mathematics classroom.

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2. Mathematics teaching as a cultural activity

Several studies of the 1990s, particularly the Trends in International Mathematics and Science Study (TIMSS) video studies (Hiebert et al., 2003; Stigler, Gonzales, Kawanaka, Knoll, & Serrano, 1999) and the Survey of Mathematics and Science Opportunities (Schmidt et al., 1996), concluded that mathematics teaching, drawing on a subconscious routine and consistent re-enactment of particular pedagogies (Cogan & Schmidt, 1999; Kawanaka, Stigler, & Hiebert, 1999), is culturally normative. That is, teachers of mathematics adhere, consciously or otherwise, to a culturally determined script that research has continued to confirm (Andrews & Sayers, 2013). Much of the research in the field has compared the teaching of mathematics in East Asian countries and the United States, typically motivated by concerns that US students underperform on international tests of achievement. Indeed, an early study in the field found that every examined variable discriminated between the teaching of mathematics in Japan, Taiwan and the US (Stigler & Perry, 1988). However, differences in the mathematics didactics of such culturally diverse countries are not the focus of this paper, not least because researchers are increasingly aware that such broad categorisations mask significant differences within nations hitherto considered culturally similar. For example, within the Chinese context, there is mathematics teaching variation across urban and rural regions (Ma, Zhao, & Tuo, 2004), which Wong (2004) argues is unsurprising as China comprises 56 ethnic groups, each with particular educational expectations. In other words, dichotomisations in which culturally East and culturally West are compared typically fail to acknowledge cultural variation within these broad categorisations. Indeed, the first author's own work, which has typically focused on understanding the classroom manifestation of mathematics in European countries, has identified considerable similarities and cross-cultural variation in teachers' didactical emphases and practices (Andrews & Sayers, 2012). For instance, while all teachers spend large proportions of their lesson time explaining, they differ in the extent to which they promote problem solving (Andrews, 2009a, 2009b). However, even within countries, teachers may behave in accordance with broadly defined categories of activity, variation within cultural groups should be expected and that typologies of mathematical didactics may transcend cultural boundaries (Andrews, 2007; Andrews & Sayers, 2013).

3. The typical Swedish lesson

Research on the typical Swedish lesson is not extensive. Further, much of the research that has been undertaken with respect to Swedish mathematics lessons has been part of the Learner's Perspective Study (LPS), which video-recorded a sequence of consecutive lessons from three teachers of year eight mathematics in a dozen countries. Thus, acknowledging that only three teachers, defined locally as competent, were studied in Sweden, little can be generalised from the study. Before examining this literature, however, it is important to consider the socio-historical context in which the Swedish mathematics lesson is located. In broad terms, Swedish education "rests on a moral ideal of democracy… It expresses a political vision of a school where children shall have an equal education, regardless of their place of residence, social background, physical and mental abilities" (Blossing & Söderström, 2014, p. 17). Moreover, curricular documents asserted that all who worked in school were obliged to promote democratic structures to the extent that students were expected to have influence over all aspects of their education; the goal has become one of encouraging "a self-regulating, autonomous and responsible learner who exerts considerable influence over his or her own personal study situation" (Lundahl & Olson, 2013, p. 205). The achievement of such goals has seen a gradual abandonment of traditional whole class teaching in favour of increased individualisation (Carlgren, Klette, Mýrdal, Schnack, & Simola, 2006), particularly with respect to mathematics (Emanuelsson & Sahlström, 2006). Indeed, "students are supposed to take a large part of the responsibility for motivating themselves and for planning and accomplishing their own mathematics learning" (Hansson, 2010, p. 172), with the increasing support of their parents (Blossing & Söderström, 2014).

Turning first to the LPS-related material, three forms of lesson typically found in Sweden have been identified. These are lessons presented "from the teacher's desk from start to finish, lessons which contained both teacher lectures and work in small groups, and lessons where students spent almost all their time working in small groups" (Emanuelsson & Sahlström, 2006, p. 311). Of the three, "the mixed

pattern is the most common in which students work in groups of two or three or sometimes alone". This accords with the findings of Liljestrand and Runesson (2006) that eight of the 12 grade eight lessons analysed by the LPS "started with a plenary session followed by individual seatwork where the pupils worked by themselves with individual assignments from the textbook" (p. 168). Häggström (2006), summarising a single LPS year eight classroom, adds a little variation to the theme of teacher presentation and seatwork. While students spend most of their time "solving problems from the textbook individually… but not necessarily precisely same problems at the same time" (Häggström, 2006, p. 192), the teacher's public presentations typically take one of two forms. Either "lessons start with a teacher-led discussion on a typical problem on the actual topic" or students' seatwork is interrupted when the teacher identifies "a particular problem that many students are asking questions about" (Häggström, 2006, p. 192). In general, these whole class episodes entail the teacher telling or asking and answering his own rhetorical questions (Häggström, 2006). However, as indicated above, these somewhat similar descriptions of the typical lesson, albeit framed analytically differently, derive from the same limited set of video-recorded lessons, highlighting the need for some external verification. In this regard, the national school agency found much evidence of students working individually, in the sense that each student works on the same material at different rates, and rare occurrences of public presentations of mathematical ideas (Skolverket, 2003). In other words, the official report identified practice more aligned with an increased expectation of individualisation than did the LPS analyses.

From the perspective of teacher education, teacher educators privilege student teachers circulating their classrooms to listen to and support individual pupils but have expectation of student teachers working on "methods for how to teach different kinds of children mathematics; a good teacher makes many important decisions in a given situation, and such decisions are directed towards individual students" (Hemmi & Ryve, 2015a, p. 194). Moreover, when circulating their classrooms, teacher education students are not expected to explain but support students by listening and asking questions; this "picture of the teacher as not taking the lead or introducing students to certain ways of thinking is prevalent in the discourse" (Hemmi & Ryve, 2015b, p. 508). This emphasis on the individual has not been without critique, not least because the "increasing individualization of mathematics education, with reduced teacher responsibility for the learning processes as a consequence, has been accompanied by declining mathematics results" (Hansson, 2012, p. 105).

4. Students' perspectives on the typical lesson

By the time they finish school, students are likely to have developed clear perspectives on the nature of mathematics, mathematical learning and what is appropriate mathematics-related classroom behaviour (Cobb, 1985). These perspectives, "are formed from thousands of hours of observation of teachers, good and bad, over the previous fifteen or so years" (Clark, 1988, p. 7). Furthermore, if, as indicated above, teachers' practices are culturally normative then it would be reasonable to assume that students' perspectives on the typical lesson will reflect those norms (Schommer-Aikins, 2004). In other words, it would be reasonable to assume that Swedish students' perspectives on the typical lesson would reflect a culturally unique interpretation of a culturally unique set of experiences. Interestingly, however, while much research has focused on students' perspectives on the nature of mathematics and mathematical learning, both internationally and in Sweden, few studies have examined their perspectives on the structure of the typical lesson.

From the student standpoint, a small number of qualitative studies, for example, Boaler (1997) and Nardi and Steward (2003) in the UK, have examined qualitatively the impact of classroom practices on students' reaction to school mathematics. In so doing they have alluded to the typical lesson experienced by students but frame such descriptions against the explicit goals of their studies. For example, Nardi and Steward (2003) undertook group interviews with average attaining year nine students in three schools in rural England. Focused on understanding the experiences of 'quietly disaffected' students, they found mathematics learning environments in which tedium, isolation, rote learning, elitism and depersonalisation dominated. While such characteristics cannot be construed as descriptions of students' typical lesson, some elements can be inferred. For example, they imply learning experiences dominated by rote learning in contexts in which students feel invisible. In similar vein, a number of quantitative studies, typically deriving them from the literature, have implicitly addressed the typical lesson by

investigating students' views on a variety of classroom practices, as with the studies of Dorman (2003, 2008), Fall and Roberts (2012), Greene, Miller, Crowson, Duke, and Akey (2004), Klassen and Tze (2014), Neuman and Hemmi (2013), Rakoczy, Harks, Klieme, Blum, and Hochweber (2013), Ryan and Patrick (2001), Sakiz, Pape, and Hoy (2012) and Turner et al. (2002). In such studies, students' own views as to the nature of the teaching they received were subordinated to those constructs addressed by the researchers concerned, an omission this paper aims to redress. Finally, with respect to Swedish students' views of the typical lesson little is known, although they claim to experience long bouts of teacher exposition and regular tests (Hansson, 2010).

5. Methods

This paper draws on data from a group interview study of Swedish upper secondary students' perspectives on the nature and purpose of school mathematics. In the particular context of Sweden, upper secondary school refers to a three-year programme that follows the end of compulsory school in year nine. Upper secondary school, to which most students elect to attend, offers a relatively large number of tracks, both academic and vocational. Irrespective of track, all students are obliged to study at least the first of five mathematics courses of increasing difficulty and sophistication. In the context of this study, 18 group interviews were conducted with 50 students from four different Stockholm schools. Three of these four schools involved offered both academic and vocational tracks, while one offered only academic tracks. Thus, we make no claims about the representativeness of the schools nor do we seek to generalise, although it would be reasonable to infer future lines of research. Significant in this decision was the perception that group interviews "are especially useful in obtaining student reactions to a course as a whole" (Edmiston, 1944, p. 593) and facilitate exploratory research focused on "looking at a social context that is unfamiliar or new" in ways that will facilitate a better understanding of that context (Frey & Fontana, 1991, p. 177). Moreover, by

> allowing opinions to bounce back and forth and be modified by the group, rather than being the definitive statement of a single respondent, group interviews would allow us to elaborate statements made (Frey & Fontana, 1991, p. 178).

Finally, with respect to notions of generality, consideration had been given to the number of interviews to be conducted. On the one hand, it would be ethically unwise to undertake too many and run the risk of gathering data that would never contribute to the analysis. On the other hand, if too few interviews are undertaken then thematic saturation, or the point after which no new ideas are generated by the analysis (O'Reilly & Parker, 2013), may not be reached. In this respect, earlier studies of a similar nature, found nine focus group interviews sufficient in a study of Mexican upper secondary students' mathematics-related emotions (Martínez-Sierra & García-González, 2017), twelve interviews with high risk of HIV women in Africa (Guest, Bunce, & Johnson, 2006) and sixteen interviews in a study of athletes' emotional responses to injury (Johnston & Carroll, 1998). Importantly, where a study is focused on understanding "common perceptions and experiences among a group of relatively homogeneous individuals, twelve interviews should suffice" (Guest et al., 2006, p. 79). Thus, we arranged to undertake 20 interviews, two of which failed to materialise, leaving the 18 reported here, which, as we show below, proved sufficient for thematic saturation.

Interviews were structured around five broad questions, one of which aimed to elicit students' perspectives on the typical lesson. In so doing, students were being invited, by means of group-prompted reflections, to synthesise their experientially derived perceptions towards an object (Dilworth, 2005). Interviews, for which appropriate permissions had been received, were undertaken at a time convenient to the students and recorded by means of webcams on laptop computers. This decision was justified in the following ways. Firstly, video, particularly when people talk over each other, enables better transcriptions than sound alone. Secondly, video recorded interviews, which capture non-verbal communication, allow for more nuanced interpretations than sound alone. Thirdly, laptops were thought to be less intrusive than conventional video equipment. Fourthly, laptops allow the recording of data directly to their hard-drives, simplifying data transfer, storage and analysis.

All interviews were transcribed and scrutinised for episodes in which students discussed, either directly or indirectly, the typical mathematics lesson. These episodes were then subjected to a constant comparison analysis whereby each episode was read and re-read and categories of response identified and compared with each other (Boeije, 2002; Fram, 2013). With each new category, previously read episodes were re-read to determine whether the new category applied to them also. This inductive process facilitates the development of theory through "categorizing, coding, delineating categories and connecting them" (Boeije, 2002, p. 393). In the following, we present the results of this process.

6. The typical lesson

Most interviews involved frequent use of the word *genomgång*, a word for which no English translation exists. Broadly speaking, *genomgång* refers to those periods of a lesson when teachers engage with the whole class publicly. The noun, *genomgång*, which loosely means a going through, a review, a briefing or an exposition, is frequently associated with a verb, *gå igenom*, to go through. In the following, we have elected to keep the word *genomgång* not only because its ubiquity implies an important culturally-located role in Swedish mathematics teaching discourse, but precisely because it has no English translation. However, while the noun takes four forms in Swedish, according to whether it is singular or plural, definite or indefinite, for ease of reading we have elected to use the single indefinite form as though it were a standard English noun.

Typical descriptions of the typical lesson were found in the words of Andreas, Dennis and Max, students following the first year of the electricity programme, who said that:

Andreas: We have a *genomgång*

Max: Yes *genomgång* and then work; yes it's kind of exactly in that order.

Interviewer: What do you mean by work?

Dennis: We work from the book

Max We work from the book, we have exercises…

For these students a typical lesson involved, as summarised by Max, '*genomgångs* and book', views reflecting those of many others. For example, Emil and Kristoffer, second year students on the same programme, commented respectively that "I would say that it is *genomgång* first and then individual work from the book" and "*genomgång* and then exercises, and then you just ask if you need help" In similar vein, Julio, following the technology programme, commented that "a typical arrangement would be to have a little *genomgång*, a maximum of half an hour, and then individual working. It is typical of almost all topics". Such brevity was not uncommon, partly because students used the word *genomgång* in ways indicative of their assuming the word needed no explanation. This interpretation was supported by interviewers' decisions with respect to how they followed-up students' utterances. For example, in the dialogue above, the interviewer asked students to expand on their meaning of work rather than *genomgång*, tacitly confirming a collective understanding of the latter. This was not an isolated occurrence, as seen in the following exchange between Björn and his interviewer;

Björn: We normally listen to the teacher when he goes through the next chapter and then work on the chapter after he has finished talking about it

Interviewer: What does it means to work with the chapter?

Björn: Doing maths exercises from the book

Interestingly, the same conversation, now including Adam, continued, highlighting expectations that when working from the book students should work individually.

Interviewer: OK, when you work from the book can you work with someone else?

Björn: You can work with someone else but usually you do it on your own.

Interviewer: OK, is this an approach that you recognise from other subjects in school too?

> Adam: We usually have *genomgångs* and stuff but working individually is not something we do in other subjects in the same way.

Occasionally a student would say a little more about the process. For example, Martin, a student in the first year of the natural science and art programme, said that

> Well, the structure is that first the teacher talks about the chapter we are moving into. And then we work by ourselves mostly from the books, doing different exercises and so on… That's pretty much it. And so we work through… we follow the book, like chapter after chapter. Yeah, the teacher often has a *genomgång* and so on about what we're doing.

Variation on the theme was seen when students elected to use the verb to go through rather than the noun, as with Frans, a first year student on the natural science programme, who commented that:

> Normally we go through what we will be doing; first we have a short summary of what we will do, then the teacher usually holds a *genomgång* on the section we are going to work with… And then we usually complete exercises on what we have learned.

Similarly, Alice, a student on the first year of the natural science programme, noted that a typical lesson

> tends to start with our teacher writing on the board what we will do that day, what should be gone through, which pages and so on. Then she goes through it and can take tasks from the book or other sources, and then we usually get to work until the end of the lesson.

A number of student descriptions alluded to *genomgång*-like activities. For example, Torbjörn commented that "basically we just listen to what our teacher has to say… We take notes and … then we spend maybe half an hour like going through our books. You know, practising". In similar vein, Monika, a first year student on a natural science and art programme, commented that "first my teacher comes in to the classroom and he writes something on the board and… tries to explain what we are supposed to do and how to solve it". In both cases can be seen implicit descriptions of *genomgång*, in which teachers explain to students the material they are expected to learn that day.

There was occasional variation to the pattern of activity described above, although *genomgång* was never far from the foreground of students' descriptions. For example, Nadja and Ragna, two students on the technology programme, said that:

> Nadja: Well, basically we start off with some task that our teacher writes on the board, that is a bit harder to solve, so that we have to think about it and we can discuss in pairs or in groups depending on what kind of task it is. And then he explains it to us so that we get an understanding of how to solve it, so if we see something similar later on we know how to deal with it.
>
> Ragna: Yeah, and like Nadja said, he goes through every chapter on the board and then afterwards we can work with the tasks ourselves and then next lesson he does it again with a new chapter and then he goes on.

In her description, Nadja seems to suggest that although her teacher may present students with a task for discussion, he does not invite them to share the results of those discussions as part of his explanation. That is, both Nadja's and Ragna's comments suggest that his explanations are managed independently of student input, a characteristic which seems to underlie most students' comments. However, there was significant variation in the lesson structures described in an interview involving Edvard and Ola, both following an International natural science programme. They spoke, often with admiration, of their teacher who had migrated to Sweden after qualifying in Greece. They discussed his typical lesson as follows:

> Edvard: We don't work by ourselves; he writes a problem on the whiteboard and then we work on it a little bit by ourselves and then we solve it together with the class…
>
> Ola: Yeah, his teaching technique, you know, is unique… In high school… it's always been that you work in a book with friends and you do it by yourself. But in this case we never get to work, you know, from the book… He says, 'if you want to work in the book you get to do it

> at home'. But, like in class he likes doing stuff on the whiteboard and he just wants us to concentrate on him, so that he can teach us…
>
> Edvard: I've always loved maths but now I feel like I understand and I understand it much better now than I did before because, like, in ninth grade I got through by, like, born maths skills on my own, pretty much, and now that I got here I actually had to think and learn new things and it was, it was really great that we got Christos (pseudonym) because now we actually learn a lot in lessons.

In such words are not only traces of an enthusiasm missing from the typical descriptions of their peers, but a clear articulation of a practice different from what these two students had experienced earlier. Firstly, when he asks students to discuss a problem he involves them in the discussion of the solution, secondly, he rejects spending time on working from the book as something that could be achieved at home, thirdly, he sees the lesson as a sequence of similar episodes in which a problem is presented, students work individually or in pairs before a collective going through. Significantly, Edvard seems clear that Christos' atypical approach to teaching in general and *genomgång* in particular has helped him understand mathematics better than previously.

In sum, and acknowledging the atypicality described by Edvard and Ola, the overwhelming sense was that a typical lesson comprised an element of *genomgång* followed by work from the book, although the emphases seemed to vary according to the teacher, as noted by Julio, who commented that some teachers "focus more on the more book work while others focus more on the *genomgång*". In the following two sections, we explore, in as much depth as space allows, how students construe these two elements of their typical mathematics lesson.

7. The form and function of *genomgång*

In every interview, even the few that did not include the word *genomgång*, some mention was made of teachers going through something. In this respect, Martin, whose comments included both forms of expression, were typical of others. He said:

> We usually start with a *genomgång* where our teacher goes through an example that maybe we pupils don't have any clue how to answer… and that's because it's a new area for us. And so he starts going through this new method… We usually listen and are free to take notes, but you don't have to. So, you listen as good as you can, I guess, and follow and try to understand...

For Martin, a *genomgång* is the introduction to the lesson during which his teacher goes through something, typically through demonstrating the day's new procedure. Significant in his description was the expectation that students listen and make notes, a perspective confirmed in several other interviews. For example, having agreed that typical *genomgångs* entail teachers "going through new stuff", Torbjörn added, with a hint of irony, that students "just shut up and listen" to which Lars added, "yeah, and take notes".

In every interview students indicated that *genomgångs* are typically focused on the learning of procedures and that their role is to ensure they understand what their teacher is showing them. However, there were occasional deviations. For example, in four interviews students spoke of how students may be invited to the board to present their solutions to a problem, a practice mentioned, among others, by Jan, who commented that on occasions:

> He can give us an example for the class to do together and if there is someone who wants to go forward, for example, to the board, you can go and report how you do it so that the class should understand.

Finally, students in three interviews mentioned that teachers undertook *genomgångs* to resolve issues of collective importance that emerge from periods of seatwork. For example, Ragna, having confirmed with her friend Nadja the typical *genomgång* described above, added that,

> often he goes through the harder tasks we maybe didn't do the previous day, that we couldn't solve, he goes through them so that we can move on to the next chapter.

In sum, for all students a typical *genomgång* refers to the introductory part of a lesson where teachers demonstrate new procedures and students quietly take notes. Occasionally, teachers may use a *genomgång* for working through of problems that students had earlier found challenging. Finally, a handful of teachers were described as exploiting *genomgångs* in which students were invited to the board to explain their own solutions. However, it transpired that none of these teachers had undertaken their initial teacher education in Sweden.

8. Working from the book

In all interviews, students spoke of working from the book, although many utterances indicated that this was a placeholder for seatwork that was manifested in different ways. For example, when working from the book teachers' expectations seemed to vary. Some students spoke of how their teachers "hand-picked tasks (that are) important for us to do". Others spoke of being unconstrained, as indicated by Torbjörn:

> Torbjörn: You're free to choose, you know (laughs), you know it's your studies so, you know, you decide what you want to study…
>
> Interviewer: Does your teacher give any recommendations?
>
> Torbjörn: Yeah of course, he says, you know, you should do these pages, but then again he doesn't stop you if you do something else…

This sense of independence, which permeated all interviews, elicited the following comment from Simon, who said that "It's a very strange thing with the Swedish system that everyone can do pretty much whatever they want".

A second independence-related theme, recurrent in all interviews, concerned students working alone or with friends. For example, in response to being asked about what follows a typical *genomgång*, Alice commented that "one works on tasks from the book" before her companion, Manja, added "usually alone, but one can pair up with a friend if you do not understand anything, so there is a little choice". Others offered similar thoughts, as in Ragna's comment that "we can choose… sometimes if I want to work alone I can do that and next lesson if I want to work with Nadja I can do that".

Finally, when asked what their teacher does during periods of seatwork, Albin spoke for many when he said that "He walks around helping those who need it". However, not all students reported such behaviour, as with Martin's comment that "of course, he helps when someone raises their hands and asks about their task, but a lot of the time I do not know what he does. He sits there with his computer".

In sum, a number of common themes emerged with respect to how students construe working from the book. Firstly, with a few exceptions, teachers rarely specified the tasks students were expected to complete from an exercise, allowing them to decide for themselves. Secondly, students were free to decide for themselves if they worked alone or in pairs. Thirdly, it was not uncommon for teachers to supplement the book with material obtained elsewhere. Fourthly, the extent to which teachers circulated the room and supported students was variable.

9. Discussion

In this paper our goals were two-fold. The first was to elicit Swedish upper secondary students' perspectives on the typical mathematics lesson, something that has not been undertaken previously. The second was to examine the efficacy of group interviews as an approach to eliciting those perspectives. With respect to the use of group interviews, the quality of students' utterances indicated that the process allowed them time to consider their responses and bounce ideas off their friends. That is, group interviews, as proposed nearly three-quarters of a century earlier, not only proved effective in determining students' reactions to their courses (Edmiston, 1944) but facilitated their being "able to encourage each other to recall specific events, to spur each other's memories, and to discuss the details of a particular item in order to arrive at a consensus" (Huntington, 1998, p. 240).

With respect to the students' perspectives on the typical lesson their descriptions were very full and, interestingly, similar. Indeed, what could be viewed as surprising is the lack of any variation. No student

commented, for example, that the typical lesson was difficult to describe because it varied so much from day to day. This similarity was manifested in variants of the description, *genomgång* and book. In other words, students saw the typical lesson as a teacher-led introduction followed by periods in which they worked individually from their textbooks. In this respect, although there is limited evidence of different lesson structures having been identified in Swedish mathematics classrooms (Emanuelsson & Sahlström, 2006), the singular lesson structure identified above accords with earlier research highlighting the commonality of lessons that "started with a plenary session followed by individual seatwork where the pupils worked by themselves with individual assignments from the textbook" (Liljestrand & Runesson, 2006, p. 168). Moreover, with respect to the periods of seatwork, students' comments indicated, as found by Johansson (2007, p. 45), that working on tasks from the textbook is "probably the most common activity in Sweden".

What is also of interest is the extent to which participants saw *genomgång* as in no need of elaboration. Indeed, as was mentioned earlier, so well-established is the notion of *genomgång* in Swedish classroom discourse that on several occasions interviewers, when the opportunity to probe students' responses emerged, invited comment on how students construed the work that followed a *genomgång* rather than the *genomgång* itself. As such, *genomgång* can be construed as a folkway of Swedish mathematics teaching (Buchmann, 1987). That is, while such practices may be educationally effective, they are typically uncodified and "warranted by their existence and taken-for-granted effectiveness" (Buchmann, 1987, p. 154). They "are learned by tradition and imitation; having the authority of custom and habit... insiders feel that the folkways are 'true' and 'right'" (Buchmann, 1987, p. 155). Thus, if *genomgång* is so deep-rooted in the Swedish classroom discourse as to be invisible to interview participants, then there is little surprise that Swedish commentators on the typical lesson have failed to comment on it (see e.g. Häggström, 2006; Nyström, 2003).

What is perhaps more interesting is the relationship between the practices students describe and international perspectives on mathematics teaching and learning. For example, students' descriptions of *genomgång* accord with traditional lesson introductions whereby teachers typically demonstrate the day's new procedure (Hiebert, 1999; Stanic & Kilpatrick, 1988). Also, while little can be inferred about the nature of the tasks presented to students, the format of *genomgång* and book seems not unrelated to the traditional lesson in which "the teacher is in complete control and the students' only goal is to learn operations to get the right answer" (Stipek, Givvin, Salmon, & MacGyvers, 2001, p. 214). Moreover, in students' utterances about either *genomgång* or book, there was no evidence of reform expectations whereby students work collectively on the problems they are posed (Drake, 2002; Lloyd, 1999) in order "to challenge one another's constructions in ways that facilitate the construction of increasingly shared and powerful knowledge" (Beswick, 2005, p. 43). In short, students' descriptions of the typical lesson, superficially at least, seem to resonate with elements of traditional practice alongside seatwork elements that appear unrelated to reform.

However, our view is that students' descriptions of the typical lesson have highlighted well the inadequacy of such dichotomisations. For example, with respect to seatwork, teachers inviting students to decide for themselves how they can best manage their own progress is a practice resonant with an earlier study in which students spend most of their time "solving problems from the textbook individually… but not necessarily precisely same problems at the same time" (Häggström, 2006, p. 192). This freedom for students to choose what tasks they do, which Simon construed as an oddity of the Swedish system, is perhaps the key to understanding Swedish mathematics teaching, an understanding that descriptions such as traditional and reform cannot convey. For example, if one of the goals of Swedish education is the creation of responsible and self-motivated citizens (Dahlstedt, 2009) who are willing and able to take initiative (Rose, 1996), then allowing students the freedom to choose what they do no longer seems strange. That is, Swedish students seem to be describing a system in which they are not necessarily encouraged to become independent mathematical problem solvers but independent human beings. Thus, one is drawn to the conclusion that if, as Cummings (2003) suggests, the curriculum reflects a culture's notion of the ideal person, then Sweden seems to have attained this objective.

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