

Analysing genomgång: a Swedish mathematics teaching lesson event

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In this paper, drawing on group interviews focused on Swedish upper secondary students' perspectives on school mathematics, we analyse participants' use of the noun *genomgång*. Loosely translated as a "whole class event during which the teacher goes through something" and for which there is no English equivalent, the word was used by both interviewers and interviewees even when referring to different forms of whole class activity. Analyses identified four broad categories of *genomgång* based on their form and function. With respect to form, *genomgångs* were either transmissive or participative. With respect to function they were either instructional or problem solving.

This paper stems from our noticing, while interviewing upper Swedish secondary school students about their many years of compulsory mathematics, frequent use of the noun *genomgång*¹. This word, loosely interpreted as *a whole class event during which the teacher goes through something*, was used repeatedly by interviewees and two cultural insider interviewers not only as though its meaning required no more clarification than would the word *textbook* but also to refer to any whole class episode led by the teacher irrespective of its temporal position in the lesson. However, having read some of the early transcripts, the cultural outsider first author noticed the extent to which *genomgång*, an unfamiliar word for which no English translation exists, dominated much of the discourse. This led to subsequent interviews incorporating an expectation that should students mention *genomgång* they would be invited to expand on what they meant by it. In short, this paper is, for us, an important detour on a journey originally headed elsewhere.

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Importantly, with regard to warranting this paper, we note that Häggström (2006), a cultural insider, did not mention *genomgång* when discussing the ways in which Swedish teachers introduce their mathematics lessons. This unconscious omission can be explained, we argue, in at least three ways. Firstly, *genomgång* is not the common occurrence our interviewees implied. That being said, conversations with Nordic teacher education colleagues indicated that while no such noun exists in Finnish, *genomgång* (Sweden), *gjennomgang* (Norway) and *gennemgang* (Denmark) are commonplace. Secondly, classroom routines and practices, which are "learned by tradition and imitation" (Buchmann, 1987, p. 155), may be hidden from the cultural insider but visible to the cultural outsider (Santagata, Zannoni & Stigler, 2007). Indeed, the same conversations with Nordic colleagues indicated that none of *genomgång*, *gjennomgang* or *gennemgang* is formally addressed in the teacher education programmes of Sweden, Norway or Denmark respectively. Thirdly, when attending school, students unconsciously assimilate the mathematics teaching practices common to their country's lessons, typically because the routine enactment of culturally normative didactical practices shapes how students perceive them (Andrews & Sayers, 2013). Thus, when our interview participants spoke of *genomgång* they seemed to be drawing on what Stigler and Hiebert (1999) have described as *collective mental images* of what teaching typically looks like. In this respect, it is interesting to note that throughout his study of ability grouping in Swedish upper secondary schools, Nyström (2003), writing in Swedish, used *genomgång* repeatedly with no indication that it was anything but an unproblematic given. In so doing, his use of the word, confirming its invisibility to a cultural insider, implied an assumption that his readers would know what he meant. That is, he seemed to be drawing on an unconscious *collective mental image*.

Such matters frame our interests in Swedish upper secondary students' beliefs about *genomgång* and led us to ask whether students' articulations of *genomgång* constituted the consensual form and function of a lesson event (Mok & Clarke, 2015) within Swedish mathematics classrooms. This paper, drawing on the power of the outsider to see that which is hidden from the insider, is a first pass at examining what Swedish students understand by *genomgång* and whether it constitutes a lesson event recognisable to those familiar with different classroom traditions. Indeed, as indicated above, Larson, a cultural insider, had conducted several interviews before Andrews, a cultural outsider, noticed *genomgång*'s ubiquity, a ubiquity so deeply embedded in Larson's professional discourse that *genomgång* can be found throughout his PhD but never problematised (Larson, 2014).

Lesson events

Our starting position is that all curricula not only reflect a culture's conception of an ideal person (Cummings, 1999) but are deep-seated in the national psyche and substantially more than what can be inferred from official documents. The enactment of any curricular expectation draws on configurations of belief and behaviour that distinguish teachers in one country from their culturally different colleagues (Andrews & Sayers, 2013). Moreover, within these behavioural configurations can be found practices that are so automated that their origins may be hidden from their actors, practices that Hayashi and Tobin (2011) have described as *implicit cultural pedagogies*. For example, Japanese preschool teachers employ a practice known as *mimamoru* for dealing with altercations between children. *Mimamoru*, which can be translated as "teaching by watching and waiting" (Tobin & Hayashi, 2015, p. 330), involves holding back from intervening in children's disputes and is based on the principle that too early an adult intervention removes from the class in general and individual children in particular the responsibility for managing their own behaviour. In similar vein, Andrews (1999) has written of a tradition found in Hungarian classrooms in which two students, known as *osztályfelelős* (class responsables), stand at the front of the classroom to greet their teacher and, while the rest of the class also stand, inform the teacher that the lesson is number so and so in the annual sequence of lessons and that, of the total number of children expected, three, say, are absent. On completion of this ritual, the *osztályfelelős* are thanked politely and invited to return to their seats. The students responsible for this task, and for making sure the board is clean prior to the start of the lesson, are selected weekly and the ritual ensures a quiet and polite start to the lesson.

Of significance to this paper is that practices like *mimamoru* or the role of the *osztályfelelős* not only lie outside the formal structures of teacher education programmes and official curriculum guidelines but form implicit cultural pedagogies (Hayashi & Tobin, 2011). However, it is important to note that such practices may have distinctive features sufficient to alert the cultural outsider to an existence hidden to the cultural insider, which leads us to examine the extent to which such implicit cultural pedagogies can be found in the mathematics classrooms of different cultural groups. In this respect, much work on culturally implicit pedagogies has been undertaken by the Learner's Perspective Study (LPS) (Clarke, Keitel & Shimizu, 2006), which has investigated various dimensions of classroom practice in well-taught grade eight mathematics lessons drawn from more than a dozen culturally diverse countries (Clarke & Xu, 2008). For the LPS, an emergent unit of analysis was the

lesson event, typically recognisable by "a form [...] sufficiently common to be identifiable within the classroom data from each of the countries studied" (Clarke et al., 2007, p. 287) and a function likely to vary cross culturally (Mok & Clarke, 2015). That is, a lesson event, which is a pattern of activity constructed by teachers and students as cultural agents (O'Keefe, Xu & Clarke, 2006), is "characterised by a combination of form and function", both "subject to local variation, but with an underlying familiarity and frequency of use that suggested both cross-cultural relevance and utility" (Clarke et al., 2007, p. 287).

A lesson event regularly discussed in the LPS literature, which derives from Shimizu's (1999) summary of Japanese classroom practice, is *Kikan-Shido* or between desks instruction. According to the LPS, the value of phrases like *Kikan-Shido* lies in their representing an instantly recognisable classroom practice (Clarke et al., 2007) and although there may be cultures in which teachers do not circulate while their students work, in other countries such patterns of activity are the norm. However, while the act of circulating the classroom may be familiar to many observers, teachers' intentions vary. For example, the LPS identified four main functions of *Kikan-Shido*; monitoring student activity, guiding student activity, organising on-task activity and, occasionally, social talk (Clarke et al., 2007). Importantly, individual teachers' deployment of *Kikan-Shido* is not invariant but dependent on their changing objectives. Thus, the function of lesson events like *Kikan-Shido* may vary both within and across an individual teacher's lessons (O'Keefe et al., 2006). Thus, the LPS team argues, "competent mathematics teachers have a repertoire of sophisticated variations of the *Kikan-Shido* principal functions of monitoring and guiding student mathematical activity and use these in ways that are recognised as effective by their students" (Clarke et al., 2007, p. 291).

One lesson event in the LPS framework is *beginning the lesson, the first ten minutes* (Mesiti & Clarke, 2006). Clearly, it is difficult to see how any lesson can get underway without teachers enacting some sort of introduction, if only to say "welcome and continue from where you stopped yesterday". However, with respect to the particularities of mathematics teaching, would the Hungarian use of *osztályfelelős* be considered part of this introductory ten minutes or a precursor to it? Our view, therefore, is that "beginning the lesson, the first ten minutes" is likely to comprise too many and too diverse activities to evoke the strong mental image of the common activity represented by, say, *Kikan-Shido*. Moreover, whereas *Kikan-Shido* is an expression that "honours the existence in one language of an established term that succinctly encapsulates an activity that could only be described in English by an extended phrase or lengthy definition" (Clarke et al., 2007, p. 288), the same cannot be said of *beginning the lesson, the first ten minutes*. Thus we are drawn to a conclusion that *beginning the*

lesson, the first ten minutes may be better construed as comprising different lesson events, each evoking a particular form and function. One such event, whose form and function are likely to be recognisable to any observer and which is not restricted to the beginning of a lesson, may be *genomgång*, whose pronunciation in English approximates to year-nom-gong. Moreover, because *genomgång* is not formally addressed in Swedish teacher education programmes, it may be construable as an *implicit cultural pedagogy* (Hayashi & Tobin, 2011).

On beliefs

Much research has been done internationally on the culturally determined ways in which teachers introduce mathematics to their students, but little has been done with respect to what their students think is going on. Such issues are important because what students believe about their experiences of mathematics influences how they engage with and subsequently learn it (Callejo & Vila, 2009; DeBellis & Goldin, 2006). Finally, when investigating students' mathematics-related beliefs, many studies have exploited survey instruments (Andrews & Diego-Mantecón, 2015; Op 't Eynde, De Corte & Verschaffel, 2006). These surveys typically draw on predetermined constructs, which is an inappropriate approach for an exploratory study such as this.

In broad terms, beliefs can be construed as "lenses through which one looks when interpreting the world" (Philipp, 2007, p. 257–258). They offer representations of reality that inform subsequent actions (Ernest, 1989; Harvey, 1986) and serve as organising structures (Thompson, 1992) that enable us to act in the world (Abelson, 1986; Op 't Eynde, De Corte & Verschaffel, 2002). An earlier synthesis of appropriate literature concluded that "students' mathematics-related beliefs are the implicitly or explicitly held subjective conceptions students hold to be true, that influence their mathematical learning and problem solving" (Op 't Eynde et al., 2002, p. 16); they "are an essential aspect of meaning making in general and of mathematical meaning making in particular" (Cobb, 1986, p. 2).

Beliefs function in clusters or systems focused on particular phenomena, enabling individuals to hold apparently conflicting beliefs (Abelson, 1979; Green, 1971; Op 't Eynde et al., 2002; Thompson, 1992). Beliefs within a system can be central or peripheral, primary or derivative, with primary beliefs at the centre of the system being least susceptible to influence (Green, 1971). Beliefs are both non-consensual and unbounded (Abelson, 1979; Nespor, 1987; Op 't Eynde et al., 2002). They are non-consensual in the sense that "there are no clear logical rules for determining the relevance of beliefs to real-world events and situations" (Nespor, 1987, p. 321). Also, due to the manner of their construction,

beliefs manifest "highly variable and uncertain linkages to events, situations, and knowledge systems" (ibid., p. 321), reflecting what the holder perceives to be true, and are context dependent (Bishop, Seah & Chin, 2003). They are unbounded in the sense that they "always necessarily implicate the self-concept of the believer at some level, and self-concepts have wide boundaries" (Abelson, 1979, p. 360).

Beliefs take many forms, however a synthesis of several studies, both generally and in terms of mathematics education (Abelson, 1979; Bishop et al., 2003; Cobb, 1986; Harvey, 1986; Nespor, 1987; Op 't Eynde et al., 2002; Philipp, 2007), has identified four broad categorisations. Firstly, there are beliefs that an individual holds to be incontrovertibly true. From the perspective of education such beliefs may pertain to whether a student believes academic success is due to effort or ability (Op 't Eynde et al., 2006). Such beliefs influence greatly the effort a student is prepared to make when confronted by problems and are largely unaffected by persuasion (Callejo & Vila, 2009). Secondly, there are beliefs pertaining to alternative or ideal situations that differ from current perceptions of reality and serve to define an individual's goals (Bauman & Del Rio, 2005; Op 't Eynde et al., 2006). Thirdly, there are affective or evaluative beliefs that reflect a person's response to an object that is different from the same person's knowledge about that object. Fourthly, beliefs derive from a person's episodic experiences (Bishop et al., 2003; Callejo & Vila, 2009; Philipp, 2007). That is, "beliefs often derive their subjective power, authority, and legitimacy from particular episodes or events" that "colour or frame the comprehension of events later in time" (Nespor, 1987, p. 320). Finally, Abelson (1986) distinguishes between testable beliefs (beliefs about objects within the immediate experience of the person) and distal beliefs (beliefs about objects only remotely experienced). This paper, which is focused on something about which students have many years' experience, is clearly focused on testable beliefs.

The study and its methods

This paper draws on group interviews conducted in four upper secondary schools in Sweden. In broad terms the project was focused on students' beliefs about the nature and purpose of school mathematics. One of the four broad interview questions invited students to describe their typical mathematics lesson, the outcomes of which form the basis of this paper. Importantly, it was not until several interviews had been transcribed that the first author, a cultural outsider who had not until then been involved in the interviews, noticed the ubiquity of the word *genomgång*. This had the consequence for later interviews that when students used the word they were invited to discuss what they meant by it.

This initial conception of the study, with its explicit focus on uncovering students' perspectives on the nature and purpose of school mathematics, was ideally suited to group interviews, because they facilitate exploratory research focused on "a better understanding of a social 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. (ibid., p.178)

Indeed, as the LPS found, student interviews yielded insights into teachers' intentions for and students' interpretations of different lesson events (Lui & Leung, 2013).

The data derived from 18 interviews involving 50 students from four schools, collectively offering the full range of vocational and academic tracks, in different parts of Stockholm. Modern Stockholm comprises, broadly speaking, an affluent and socially mobile city centre and suburbs typically, but not always, comprising a mixture of public and private housing providing accommodation for different social groups. In particular, due to reduced availability of public housing in the city centre, many suburbs have experienced an influx of poorer people from the city (Andersson & Turner, 2014) and low income immigrants (Marciniczak, Tammaru, Strömgren & Lindgren, 2015). Of these four schools, one reflected well this suburban demographic diversity. The second suburban school was located in an atypically wealthy suburb, in which there is little public housing and where both educational and income levels are considerably higher than the national norms (OECD, 2006). The remaining two schools were located in the city centre and drew students from both the city centre and many of the socially and ethnically diverse suburbs. One of these emphasised science and technology academic courses, while the other offered only vocational courses. In short, although we can make no claim about their being representative of all Swedish schools, our view is that these schools are likely to represent the diversity of upper secondary schools in Stockholm.

An important consideration when undertaking qualitative interview studies is the number of interviews to be undertaken. On the one hand, too few interviews will fail to yield the point after which no new ideas are generated from the analytical processes (O'Reilly & Parker, 2013). On the other hand, if too many interviews are conducted then there is an ethical risk that the contribution of some informants will be ignored as previously analysed interviews will have already reached the point of thematic saturation. To address this issue various interview studies were read to elicit the number of interviews necessary for thematic saturation.

In this respect, nine group interviews were found to be sufficient in a study of Mexican upper secondary students' mathematics-related emotions (Martínez-Sierra & García-González, 2017) 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, Bunce & Johnson, 2006, p. 79). In light of such experiences, we arranged to undertake 20 interviews, two of which failed to materialise, leaving the 18 reported here, which, as we show, proved satisfactory.

All participants were fully aware of the purpose of the research, their rights of withdrawal and, through the use of pseudonyms and other means, anonymity. Interviews, which were undertaken at a time and place determined by the students, were video recorded on laptop computers. This decision was justified in several ways. Video, especially when several participants speak simultaneously, allows for better transcriptions as it not only facilitates the identification of each speaker better than sound alone but also captures non-verbal communication. Moreover, a laptop, due to its ubiquity, creates less disruption than video cameras mounted on tripods and records data directly to its hard-drive, facilitating both data storage and analysis. With respect to analysis all interviews were transcribed and then subjected to a process of reading and re-reading during which utterances involving the word *genomgång* or its derivatives were identified. Following this, those utterances were scrutinised for any indication as to informants' interpretation of the word. This process, involving both a cultural outsider noticing and negotiating with a cultural insider the ways in which the word was used, led to the identification of two forms of *genomgång*, transmissive or participative, each associated with two functions, instructional or problem solving that structure what follows. But first, we examine students' views on the length of a typical *genomgång*. In so doing, the reader is reminded that all names are pseudonyms and unless stated otherwise refer to students.

Results

The length of a genomgång

While *genomgång* was mentioned in all eighteen interviews, its length was discussed in only thirteen. In broad terms a consensus emerged, as indicated by Torbjörn, that a typical *genomgång* lasted "like 20 minutes, half an hour". This view was supported by Martin, for whom it was around twenty minutes of a lesson of one hour's duration, Julio, for whom it comprised "about a half-hour" and Monika, for whom it lasted "between twenty and thirty minutes".

Others suggested that genomgång length varied according to circumstances. In this regard the comments of Nadja and Ragna were not atypical. They said

Nadja: It depends on how much time we need to think about things, because sometimes it takes up most part of the lesson like thirty or thirty-five minutes. But that's just because he really wants us to think about it ... But when it's smaller tasks ... (she looks at Ragna) it's like fifteen minutes.

Ragna: Yeah!

Nadja: Yeah; out of a lesson of between fifty minutes and one hour.

The longest genomgång was reported by Werner, who commented that it typically lasts "fifty to fifty-five minutes and then we get five minutes for doing exercises".

In reporting students' perspectives on the typical genomgång, it is important to acknowledge that the times students reported were perceptions and not necessarily accurate reflections of reality. However, if the majority of those students who commented – students drawn from four schools in different parts of a relatively large city – spoke of the typical genomgång being of between twenty and thirty minutes duration, it is not unlikely that this approximates some sense of truth. In other words, it seems that a genomgång is not a fleeting activity but something that not only occupies at least a third of the typical lesson but also seems to serve an important structural role in the teaching and learning of mathematics in Sweden. However, in closing this section we turn to an interview involving Felix and Ludde, who observed that,

Felix: We once had a teacher who had genomgångs throughout the lesson, and it was as tough as hell.

Ludde: One becomes so bored.

Felix: And towards the end people do not listen.

While this was clearly a minority view, it indicates that some teachers are perceived as not only devoting the majority, if not all, of their lesson time to genomgångs but also, if boredom and ceasing to listen are indicators, somewhat futile genomgångs.

The form and function of genomgång

From the student perspective the function of a genomgång was simply described by Mattias, who commented that a "genomgång is to help us get an understanding in order to be able to work on the tasks". However, as the analyses unfolded two forms of genomgång, each with two distinct functions emerged. The two forms of genomgång we have construed as *transmissive* and *participative*; a transmissive genomgång is a whole-class

episode during which the teacher talks to a passive class and a participative *genomgång* as a whole-class episode in which both teacher and students are actively engaged. The two functions of *genomgång* we construe as *instructional* and *problem solving*; an instructional *genomgång* focuses on introducing new material or procedures and a problem solving *genomgång* focuses on the solution to mathematical problems. In the following we present each of these four categorisations, starting with the most common.

A transmissive instructional genomgång

In every interview students spoke of a *genomgång* in which their teachers instructed the class, with rare opportunities for participation, on the procedure to be learnt that day. For example, Martin, whose comments reflected those of most other students, summarised his perception of *genomgång* as follows:

Martin: We usually start with a *genomgång* and 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 then he starts going through this new method that is part of the new chapter that we're moving into ... 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 ...

Interv.: Does he question you during this time?

Martin: Er, yeah, he might do that ... Yeah, sometimes he asks if anyone knows what to do next ... But mostly it's like a sort of, demonstration of what to do ... Because after the demonstration we will be working with tasks on the topic, and we need to understand them.

In similar vein, Torbjörn, in an interview with his friend Lars, commented that his teacher:

gives examples, you know, he goes through new stuff that we like... first we go through new stuff that we haven't like done in the books before and then he like gives examples you know he writes, like he writes examples on the board and then after we have learnt that we try to, you know, get through it in the books.

For Martin, a *genomgång* is an opportunity to listen to the teacher demonstrating the day's new procedure, during which the role of the student is to follow what is being said and take notes. This latter aspect was exemplified in the comments made later by Torbjörn and his friend Lars, who, following Torbjörn's comments above, added, with a hint of irony, that their role was to

Torbjörn: Just shut up and listen, I guess (both laugh).

Lars: Yeah, and take notes.

Indeed, the taking of notes was a recurrent theme, although there was some deviation. For example, as in the following extract from Werner's and Hans' interview:

Werner: It depends, but for me I listen while I take notes. I write exactly what he is writing, so it memorises my brain better ... (looks at Hans)

Hans: (breaks in) Yeah, I usually just listen, because I don't like writing so much.

Throughout the above, genomgångs seem focused on establishing the mathematical procedures necessary for the successful completion of the day's tasks. Implicit in students' comments was an understanding that they see the teacher's role as one of demonstrating, while theirs is to find ways of ensuring they understand, typically by making notes.

A transmissive problem solving genomgång

Occasionally students described how teachers began a lesson by introducing and then solving, with no student input, a mathematical problem. For example, Monika commented that typically "my teacher comes to the classroom and writes something on the board, a mathematical problem, and tries to explain ... how to solve it". On other, equally rare, occasions, students described a situation in which teachers began their lessons by going through problems that had proved difficult the previous day. On such occasions, the problems were familiar, as described by Ragna, who said that

Often he goes through the harder problems that we maybe didn't do the previous day, those that we couldn't solve; he goes through them so that we can move on to the next chapter.

Monika, having already described the unfamiliar problems posed by her teacher at the start of the lesson, added that during periods of seatwork they would,

Work on our problems and then he, when we ask questions, if he finds that we ask similar questions, he shows how to solve them in front of the entire class, yeah.

In this respect, highlighting the rarity of such events, it was Monika who described two distinctly different forms of transmissive problem solving genomgång. On the one hand she described a proactive event in which her teacher began lessons with a novel problem, while on the other hand she described a reactive event in which her teacher resolved collective difficulties during the lesson. For Ragna, while lessons typically start

with a transmissive instructive *genomgång*, there are occasions when her teachers starts his lesson in a reactive manner by solving problems students had found difficult the previous lesson.

A participative instructive genomgång

In around a third of the interviews, students spoke of their teachers engaging them as participants in their *genomgångs*. For example, Jan, who was interviewed along with Kurt and Magnus, noted that his

Teacher writes an example on the board, an equation for example, and then he goes through the different rules that apply to solving the equation. And so he is trying to get everyone to understand these rules. And then also 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.

In similar vein, Hans, commented that his teacher "sometimes calls ... us out to try to take on a task, so we get some exercise doing that way". In such circumstances, particularly that described by Jan, teachers may follow a transmissive instructive *genomgång* with an episode during which they pose problems for collective discussion and explicit student input at the board. On such occasions, involving routine tasks, students become active participants in some form of public discussion of the solution.

Finally, Manja described a similar activity, albeit one which is introduced differently. She said,

and then (while working from the book) we sometimes, or quite often, she (the teacher) puts examples on the board and then you get to work with them alone or in pairs, and then she chooses different people who go up to the board and write. So everybody gets to share their solutions and how they think and so on.

Thus, for Manja, this particular form of *genomgång*, which was discussed after she and her friends, Alice and Göte, had described a typical transmissive instructional *genomgång*, is undertaken during periods of seat-work. It involves a deliberate posing of a routine task for individual or paired working before a public sharing of solution strategies.

A participative problem solving genomgång

In two interviews, both conducted with students taught by the same teacher, students spoke with excitement about their teacher, Christos, and how he managed their lessons. For example, Helga and Sven commented that

Helga: I think is our maths classes are kind of different from what I'm used to ... We have Christos in maths and he stands there in front and he talks and he writes on the board and we solve, like, problems together and he asks questions. And so we get to interact with him to understand and to really break things down and what we're learning to really see where things come from and why do we do this ... We do problem solving on the white board and break things down so everyone understands it.

Sven: Yeah, one big difference, between this school and my old school, talking about maths classes, is that here we don't work in the book at all. Like, we just, we just interact with Christos while he solves problems with us on the whiteboard.

Interestingly, as their interview unfolded, it emerged unprompted that not only was Christos different from any teachers they had experienced previously but that he had learnt university mathematics in a country with didactical traditions different from Sweden. Indeed, Elias, who was also taught by Christos, commented that

Yeah, we barely work alone at all, we don't work by ourselves ... he writes a problem on the whiteboard and then we either work on it a little bit by ourselves and then we solve it together with the class.

Finally, in this section, the comments of Helga, Sven and Elias suggest not only that Christos' genomgångs are different from those with which they had previously been familiar but also, as evidenced in Helga's comments that "we get to interact with him to understand and to really break things down and ... to really see where things come from and why do we do this" that they are a form of genomgång preferable to those they had previously experienced.

The role of questions in a genomgång

During their interviews, prompted or not, many students mentioned how their teachers used questions during a genomgång. For example, Nadja began her summary of a typical genomgång by suggesting that "he starts off by asking a lot of questions". Other students offered more detail, typically in response to interviewer prompts about their teachers' use of questions. In this respect, Magnus commented that "he both asks and answers questions", implying that students, at least in his class, were not typically involved in the process. Magnus' perspective was confirmed by Monika, who commented that her teacher asks "rhetorical questions mostly". This use of closed questions, whether student responses were expected or not, resonated with Torbjörn, who commented that "he uses Socratic questions, you know, to try to solve the questions there".

Other students offered indications that not all questions were closed. Jakob, for example, commented that "sometimes he asks, 'and what are the next steps?' And then he asks then, 'if I take less here, what should I do on the other side then?'" From such a statement can be inferred two forms of activity; on the one hand it represents an authentic open question focused on determining whether students know how to proceed, while on the other it reflects a closed form of question tied to particular teacher presented cues. In broad terms, however, students seemed clear as to the purpose of their teachers' questions, as indicated in Frans' comment that his teacher poses questions "to see if we understand" and Helga's earlier comment that her teacher, Christos, asks questions to help them solve problems together.

In sum, where students discussed their teachers' *genomgång*-related questions, there was some variation in their manifestation. For some, as seen in Nadja's "he starts off by asking a lot of questions", little detail can be inferred. For a small group, represented by Jakob, there was an indication that questions could be either open or closed. However, the largest group indicated that questions asked during *genomgångs* were typically closed, intended to facilitate learning but often answered by the teachers themselves. Finally, with respect to students' beliefs about *genomgångs*, we turn to Albin, whose comments seemed particularly telling. Acknowledging that he was "into the lessons all the time", he added, with respect to *genomgångs*, that

I listened to him quite a lot and I answered a lot of the questions he asked but ... (I actually didn't try that much because I slept a lot in the lessons, but that was only when we were supposed to work from the books.

Discussion

In this paper, we set out to examine Swedish upper secondary students' perspectives on *genomgång* as an integral element of Swedish mathematics classrooms. Our interest in so doing was prompted by the first author, a cultural outsider, noticing the ubiquity of the word in interview transcripts focused on students' construal of the typical mathematics lesson. This noticing of a word with no English translation led to three questions. Firstly, is *genomgång* the ubiquitous activity that the informal conversations with colleagues discussed in the introduction suggested it is? Secondly, does it have a form and function that would classify it as a lesson event (Clarke et al., 2007)? Thirdly, how efficacious were group interviews in uncovering students' perspectives on their experiences of Swedish mathematics classrooms?

In respect of the first question, the fact that genomgång was mentioned in every interview confirms the word's ubiquity within the Swedish mathematics classroom discourse. However, students' use of the word alluded to four broad categorisations, confirming that while the word is commonly used its meaning varies. This variation is interesting because Swedish researchers, when discussing the ways in which teachers introduce their lessons, tend to write in broad terms along the lines of, teachers typically start their lessons "with a plenary session followed by individual seatwork" (Liljestrand & Runesson, 2006, p. 168). Moreover, when writing their research reports in Swedish, the word genomgång seems to be used with little explicit awareness that it may represent different forms of activity, as in Nyström (2003) and Larson (2014). Thus, this paper has shown that while genomgång is, indeed, a ubiquitous activity, and can certainly be construed as *implicit cultural pedagogy* (Hayashi & Tobin, 2011), it takes different forms and functions not previously acknowledged.

From the perspective of their form, transmissive genomgångs were the most frequently inferred from students' utterances, while from the perspective of function, instructional genomgångs were the most frequent. Putting these together it is no surprise that the most common genomgång, mentioned in every interview, was a transmissive instructional genomgång in which students passively, in the sense that there was rare interaction, observed a demonstration of a mathematical procedure for practising during subsequent periods of seatwork. Such a view accords with earlier analyses showing that most whole class episodes entail the teacher lecturing (Emanuelsson & Sahlström, 2006) or asking and answering his own rhetorical questions (Häggström, 2006). Initially, we were minded to describe such genomgångs as explanatory, but didactical explanations entail the explicit collaboration of all participants (Leinhardt, 2001), which these do not.

The second form of transmissive genomgång, focused on problem solving, was an interesting juxtaposition of traditional didactics and the goals of mathematics education reform (Hiebert, 1999) manifested in two ways. The first, rarest and incongruous, was a proactive form in which teachers posed a genuine mathematical problem at the start of a lesson and proceeded to solve it transmissively. The second was a reactive form that could be found either at the start or during the lesson itself, reflecting earlier studies in which Swedish teachers may interrupt their lessons as they identify "a particular problem that many students are asking questions about" (Häggström, 2006, p. 192). In these reactive forms, teachers are seen to respond to student difficulties, albeit in a transmissive and non-participative manner.

Participative instructional genomgångs were discussed in around a third of all interviews and occurred only at the start of the lesson.

Generally, they followed a transmissive instructional genomgång and entailed the teacher presenting a task, which the class would solve collectively. That students distinguished these two genomgångs is important, as they could easily have been construed as one. Such genomgångs enable teachers to check, after a transmissive instructional genomgång, students' readiness for independent seatwork. Finally, accounts from which participative problem solving genomgångs could be inferred arose only in interviews conducted with students taught by a teacher whose teacher education had been undertaken outside Sweden and whose practices resonated with the didactical traditions found in Hungary, whereby a teacher presents a problem, students work individually for a few minutes before solutions are shared publicly (Andrews, 2003).

The summary of these four genomgångs takes us to the second question; can genomgång be construed as a lesson event? Does it have a form instantly recognisable to both cultural insiders and outsiders? Does it embody particular didactical expectations that, within the instantly recognisable form, may differ from one cultural group to another (Clarke et al., 2007; O'Keefe et al., 2006)? With respect to form, we would argue that a genomgång, whether transmissive or participative, would be recognisable to both cultural insiders and outsiders, not least because it entails teachers engaging the whole class in a public discourse, either unidirectional or multidirectional, that few people would fail to recognise. With respect to its didactical expectations, or function, both instructional and problem solving ambitions are manifested in different ways by different teachers, particularly participative problem solving genomgångs, which seemed the domain only of teachers not educated in Sweden. In short, genomgång can be construed as a lesson event, not least because the manner of the codification above addresses Clarke et al.'s (2007) concerns about researchers' failure to address in sufficient depth the distinction between the title of the activity itself and the accounts of the enactment of that activity. Moreover, student views on the length of the typical genomgång confirm that genomgång is more theoretically and practically useful than *beginning the lesson, the first ten minutes* (Mesiti & Clarke, 2006).

Finally, with respect to the third question, to what extent does an analysis of students' perspectives on the phenomenon contribute to our understanding of the relationship between beliefs and classroom actuality? Our view is that students' genomgång-related utterances, whether prompted or unprompted, were unproblematically derived from those episodic experiences that ultimately "colour or frame the comprehension of events later in time" (Nespor, 1987, p.320). Their comments reflected not random thoughts but events, both recent and past, as seen

in Nadja's comments about the varying lengths of genomgång she had experienced. With respect to notions of certainty, students' utterances drew on words like "usually", "typically" and "mostly"; indicating that while things may not always be the same, there is a routine predictability in their interpretation of genomgång. This predictability, or experiential truth, was further supported by Edvard's "we barely work alone at all", and Werner's "I write exactly what he is writing". Moreover, from Helga's "I think our maths classes are kind of different from what I'm used to" can be inferred an awareness of an alternative comprising a reality less monotonous and more inspiring than the norm and, finally, from Felix's "We once had a teacher who had genomgångs throughout the lesson, and it was as tough as hell" can be inferred evaluation. That being said, while there was evidence of students evaluating and being aware of alternatives, there were few indications of complaint; they offered largely matter-of-fact accounts of a part of their educational lives over which they have limited control. In sum, students' utterances, which were enhanced and refined by the use of group interviews (Frey & Fontana, 1991), yielded sufficient evidence for them to be construed not only as indicators of testable beliefs about the form and function of genomgång but also, due to this matter-of-fact approach and broad and independent agreement, accurate representations of the form and function of genomgång in Swedish mathematics classrooms.

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Notes

- 1 Swedish nouns typically take four forms; singular indefinite, singular definite, plural indefinite and plural definite. Genomgång is the singular indefinite form, with genomgången, genomgångar and genomgångarna being the other three respectively. In this paper, for ease of reading, we have elected not to use these different forms but to use the one word, genomgång, as though it were a typical English noun.

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