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Finnish teaching materials in the hands of a Swedish teacher: The telling case of Cecilia

Tuula Koljonen

Mälardalen University, Sweden; tuula.koljonen@mdh.se.

A common perception in Sweden is that the best teachers do not rely on ready-made teaching materials. The position taken in this paper, building on socio-cultural theory, assumes that teacher materials can support teachers. Although there is an emerging body of research focusing on teachers' use of teaching materials, cross-cultural studies on this are scarce. The current study addresses this gap by offering unique insight into how a Swedish teacher makes use of teaching materials originally from Finland but slightly adapted to the Swedish context. Based on teacher interviews and classroom observations, I studied how the teacher planned for and enacted lessons. Findings indicate that she fits the material to her pre-existing practice and, thus, does not follow the material's original intentions. The results are compared with previous results on materials and their use, and finally some implications for Swedish mathematics education are presented.

Keywords: Cultural scripts, educational context, primary school, teaching materials, telling case.

Introduction

Finland is known as a country with good learning outcomes in mathematics (e.g. OECD, 2013). Furthermore, since the 1980s the country has had a tradition of producing exhaustive teacher guides (TGs) in collaboration with teachers, teacher educators and other experts (Niemi, 2012). These two factors have likely increased the interest in applying commercially produced Finnish teaching materials, such as textbooks and TGs, in Sweden as well as other countries, such as Italy. Applying new teaching material from Finland in Sweden could be achievable, as there are many similarities between the school systems in the two countries – for instance, the inclusive nine-year compulsory basic education with no special tracking, and the national core curriculum that provides an overall outline for school education. In addition, primary school teachers in both countries often teach all subjects, and are free to choose which teaching materials to use. There are also differences between the countries' educational systems; e.g., Swedish teachers at primary school level are seldom subject specialists while Finnish teachers are well educated, but also the widespread negative talk in Sweden concerning the use of ready-made teaching materials (Bergqvist et al., 2010), which does not occur in Finland. Swedish teachers' orientation toward ready-made teaching materials most certainly affects how they engage with and use them (cf. Stein, Remillard & Smith, 2007).

Swedish teachers seldom use TGs in planning and enacting mathematical instruction (Jablonka & Johansson, 2010). Instead, they rely mostly on the student textbook as their main source, a common feature of teachers in many parts of the world (Remillard, 2005; Stein et al., 2007). Also, Swedish compulsory school teachers have for the last two decades often organized individualized teaching, whereby students work individually in different areas and at their own pace (Bergqvist et al., 2010; Remillard, Van Steenbrugge & Bergqvist, 2016). The fact that students are taught largely according to the structure of their textbook has also resulted in less variation in teaching (Jablonka & Johansson, 2010). However, Finnish teachers, especially primary school teachers in mathematics, trust and use

commercially produced TGs extensively, and there are indications that Finnish teachers often organize whole-class teaching and use teaching methods other than individual seatwork. This has consequently led to a classroom practice that is different from the Swedish one (Jablonka & Johansson, 2010; Pehkonen, Ahtee & Lavonen, 2007). While there is growing interest in adopting and implementing mathematics materials in a new educational context, we know little about how imported mathematics materials are used or how they may influence classroom practice.

Therefore, in this paper I aim to investigate the interplay between a Swedish teacher and the written curriculum as represented in the suggested lesson plans in a TG – *Favorit Matematik (FM)*, originally from Finland. Moreover, I intend to show how this interplay may impact on enacted teaching. Teaching is viewed as a cultural activity, and cultural activities are represented in cultural scripts (cf. Stigler & Hiebert, 1999) and are consistent with the stable web of beliefs and assumptions within a cultural group. Scripts provide a background for interpreting behaviors; however, they do not describe, determine or predict the behavior of individual teachers (Stigler & Hiebert, 1999). Both teacher and teaching materials are significant participants and are situated in a socio-cultural context, a specific educational context. Through this, they both play a role in mediating that interplay, which is shaped by historical, social and cultural factors (Brown, 2009; Remillard, 2005). Since cultural scripts are deeply rooted in practices and are hard to see from within a given culture, I opted for a case study approach, allowing for a deep analysis. I therefore anticipate that a study on the use of teaching material from one culture by a teacher from another culture will advance our understanding of the cultural scripts in both cultures, and of the participatory relationship between teacher and teaching material.

I have previously analyzed TGs from four Finnish textbook series in mathematics, and found that their structure, form and content were relatively homogeneous (Koljonen, 2014). In Koljonen, Ryve and Hemmi (under review), we captured what kind of mathematics classroom the Finnish guides promote. Recurrent cultural scripts of the classroom practices were found, comprising: keeping the class around a specific topic; keeping the teachers and students active; clear lesson goals are vital features; different recurrent activities; concrete material; and embedded differentiation. Due to these findings and the different classroom practices in Sweden and Finland, it is of interest to investigate a Swedish teacher's interplay with Finnish teaching material as a way to compare the written and the enacted curricula grounded in two different cultural platforms. The research questions guiding this study are: 1) *How does a Swedish primary school teacher, locally regarded as competent, interact with a Finnish teacher guide while planning and implementing teaching?* 2) *How does this interaction influence the classroom practice?*

Methodology

This study is part of a larger cross-cultural project examining the interplay between Swedish and Finnish teachers using the same mathematics teaching materials. The data for this project are comprised of semi-structured interviews with four primary mathematics teachers from each country. The interview questions cover seven themes: teacher's education; teacher's experience; school settings; classroom culture; beliefs about mathematics and its teaching; TGs; and planning of lessons. Additionally, three consecutive mathematics lessons per teacher were videotaped. When videotaping during the lessons, I used two cameras: one teacher camera that captured the teacher's actions and talk, and one whole-class camera focused on the students' actions and talk. I conducted and

transcribed the audio-recorded interviews (50-110 minutes) and the videotaped lessons (40-60 minutes). *FM* (Asikainen, Nyrhinen, Rokka & Vehmas, 2015) includes references to the Swedish national core curriculum (Lgr 11), but does not describe how the lesson goals actually serve to prepare students to meet the curriculum goals. Earlier studies (Koljonen, 2014) revealed that *FM* lacks educative support (cf. Brown, 2009) for teachers as well. For example, the rationales behind its suggested lesson activities are rarely explicitly discussed, which is a critical component in teacher learning. Each lesson (4 pages) in *FM* has a similar structure, both visually and content-related; for instance, clear recurrent headings located in the same place on every page, and a variety of optional activities presented for each lesson. The activities are all linked to the central content and the lesson objectives, from which the teacher is to choose appropriate activities for their practice.

As a starting point in the larger cross-cultural project, I selected one of the Swedish teachers, Cecilia (fictitious name), to exemplify a single case as this approach offers possibilities for deeper theoretical insights that would otherwise go unseen (Andrews, In press). Cecilia graduated in 2010 as a compulsory school teacher (F-6), and was prepared to teach all other subjects besides mathematics as well. Thus, she is not a mathematical subject specialist. However, one of the criteria for selecting the teachers was that they were regarded as locally competent (cf. Clarke, 2006). Among the other teachers, Cecilia is recognized and esteemed for her locally defined ‘teaching competence’ and has been nominated by the school’s principal and the municipality and is thus regarded as a local subject specialist. At the time this study was conducted, Cecilia was in her third year of teaching with *FM*. She teaches children in Grade 3; her 24 students come from a constrained socio-economic area, with mostly non-native speaking families. Cecilia volunteered to participate, knowing the study was on *FM* and its use.

Data analysis

Teaching is viewed as a cultural activity (Stigler & Hiebert, 1999) and a design activity, whereby teachers craft instruction, and do so with different degrees of artifact appropriation: offloading, adapting and improvising (Brown, 2009). Cecilia’s interaction with TGs is characterized through these three analytical constructs. *Offloading* emerges when a teacher follows material and assigns a great degree of authority to the teaching material. That is, the agency for the delivery of content lies in the material. *Adapting*, on the other hand, occurs when a teacher reflects when elaborating with the material. Here the agency is embedded in both the material and the teacher. *Improvising*, finally, relates to when a teacher does not closely follow the material. That is, the agency lies with the teacher as she relies on her own strategies for instruction, with minimal reliance on the material. The relationship is further characterized as participatory or non-participatory (cf. Remillard, 2005). When the teacher regularly and deliberately uses the material, and also looks at it critically, this provides an intimacy between teacher and material and is thus categorized as a *participatory relationship*. Meanwhile, if the teacher’s use of the material is more tacit and sporadic, it will lack intimacy and is thus categorized as a *non-participatory relationship*. My intention is to characterize Cecilia’s interaction with the material in use (*FM*) and to compare the written curriculum in *FM* and Cecilia’s enacted curriculum. I do not intend to evaluate which degree of interaction (offloading, adapting or improvising) or the relationship (participatory or not) is better than the other. However, I acknowledge that comparison and evaluation are intertwined (cf. Jablonka, 2015). Below, I present

Cecilia as the telling case through some merged snapshots of from both interview and classroom recordings.

The telling case of Cecilia

During her interview Cecilia said that it is a waste of time making a written plan, because “if a lot of the students don’t understand today’s lesson, we would have to repeat it tomorrow and then my intended plan would crash if I’d written it down” (Cecilia, 9 Nov 2015). On the one hand, such comments indicate that Cecilia, as a locally competent teacher, trusts her ability to deliver the mathematical content with appropriate strategies for instruction. On the other hand, it can also be due to a lack of time that she does not write her plans, as she stressed that the ongoing national professional development program, Matematiklyftet, takes time away from all the things she has to do. Cecilia stated that she starts her planning for the introduction phase not by using the TG but the student textbook:

I turn to the current page in the textbook and see that the next passage is about multiplication by 9. Immediately, I have an idea about which strategies I want the students to know, and notice that the book is using the same strategy as me... but I prefer to create my own [instructions] using my own language. (Cecilia, 9 Nov 2015)

Cecilia’s prospective mental plan is partially consistent with the textbook’s plan. However, here the agency stays with Cecilia, since she claims to have her own mental plan. Her use of and interaction with the textbook could be understood through the Swedish teachers’ context, in which they are not accustomed to using TGs in planning and teaching. In addition, the minimal support provided for how TGs may be used may compel Swedish teachers to turn to the textbooks instead. This and several other similar excerpts led me to infer that Cecilia is influenced by Swedish culture, as she states that she “prefers to create her own instructions”, reflecting a generally held perception of Swedish teacher competence. During the interview, Cecilia mentioned, due to lack of time, that she occasionally glances at the TG to get a skeleton plan for the lesson. She then looks at its “introduction box”, which suggests how to introduce the lesson’s topic on the board. Hence, from the interview I infer that she perceives the material as worth having in the classroom but not necessary for planning. I infer that she improvises when planning, and that the agency lies with her. I further infer that she has a more tacit than close relationship with the material, especially since she seldom uses the TG and hardly ever reflects on the material or its impact on the context.

The video data reveal that, while mobilizing the teaching, Cecilia sequenced her lessons into four distinct episodes. The allocated lesson time of her lessons consists of: the introduction phase, taking approximately 22% (~10 min) of the lesson time; what to work on in the student textbook; the students’ individual seatwork, taking approximately 56% (~25 min) of the lesson time; and the closure of the lesson. Cecilia always starts her lessons by showing a strategy or method in the introduction phase that is applicable to that day’s pages in the student textbook, and by referring to textbook: “Hey, listen! Last Thursday we went over page 90 in the textbook, as we used these hands [pointing to the cut-out hands in fabric on the blackboard] as one strategy for multiplying by 9. Today we’ll revise it” (Cecilia’s L1, 9 Nov 2015). Here, Cecilia is simultaneously showing the textbook pages they have been working with. This revision is not included in the TG’s suggested lesson plan, and no elaboration or reflection is revealed. But this could also be due to the evaluation at the last

lesson closure. Hence, I infer that Cecilia is improvising. Nevertheless, the video data frequently show that the delivery of the content is based on the material, as she offloads the agency to the textbook as she follows the textbook pages, lesson by lesson. Cecilia is very firm during the interview that the cut-out fingers she refers to are not from the TG but were instead an idea that simply came to her. During Lesson 1, she first shows two examples of the old strategy before introducing a new strategy for multiplying by 9: “Hey guys, listen! At the top of page 91, it says ‘Multiply and write in the table’... This is a different strategy... So, let’s try this too! Ehh, *they want us to think like this...* Can you give me a multiplication from the 9 table, Ali?” (Cecilia’s L1, 9 Nov 2015). This extract illustrates Cecilia turning to a rather close offloading to the student textbook – especially when she says *they want us to think like this*. The textbook lacks a description of how to deal with this task, and the fact that Cecilia does not explain to the students how “to think” indicates that she has not elaborated on this task beforehand. I infer that she shows this task since it is included on that day’s lesson pages in order to prepare the students for their individual seatwork. However, the TG offers some explanation, and recommends that they fill in this table together in the whole-class setting, which Cecilia has missed since she does not read the TG carefully or regularly. This displays that her relationship with the TG is rather tacit. The video data further reveal that after the introduction Cecilia always tells the students which pages to work with during the individual seatwork. She does this through the material’s website and the SmartBoard, where she shows the students the pages. She also writes the pages on the whiteboard. This procedure is not stated in the material, which confirms that Cecilia is improvising and maintaining the agency. The following is an example of how she transitions the students into their individual textbook work: “I think most of you managed to do both pages 90 and 91, and possibly also 92 or 93. On page 94 it says ‘We rehearse’, and these two pages are the goal of today’s lesson” (Cecilia’s L1, 9 Nov 2015). This extract additionally confirms that Cecilia is closely offloading to the textbook, as she assigns a great degree of authority to it. At no time does she present the lesson objectives, which are clearly visible in the TG. Instead, she mentions that the lesson goal is to do pages 94 and 95. Neither does she use the different recurrent activities or concrete materials included in the TG during any of these lessons.

The video data further reveal that, during the individual seatwork, some students are working on other pages than the ones Cecilia had announced before they started working individually, and some are even working in a textbook for Grade 2. This is not in line with the material’s intention, as it offers embedded differentiation instead. As shown in the video data, Cecilia always closes the lessons with a blind evaluation to determine whether she can move on or if rehearsal is necessary.

Now, close your eyes and answer YES to my question by raising your hand. If your answer to my question is NO ... leave your hand on the table [...] ‘I feel confident about the strategy of using my fingers to multiply by 9’ Okay, those of you who have your hands up can put them down. ‘I still think it feels a little hard to use this strategy, using my fingers to multiply by 9’ Thanks! ... ‘I feel pleased with what I did during the mathematics lesson today’ Great! (Cecilia’s L1, 9 Nov 2015)

This extract confirms that Cecilia does not just say she wants all her students to be *on track* but that she also checks this before ending the lesson. In so doing, she is checking their understanding of the “old” strategy for multiplying by 9, but not whether they understand the “new” strategy she has introduced, or the objectives displayed in the guide. Two of the questions are related to the

mathematics, whereas the last is connected to students' individual seatwork. There is no support in the material for how to end the lessons, so Cecilia trusts to experience and improvises the evaluation. Hence, from the video data I deem that she uses the textbook for support for the students' individual seatwork but not for her actions or events when mobilizing the teaching. The video data show that Cecilia improvises, but does not critically reflect on the material or its impact on the educational context, or make any changes in relation to the material. In addition, at several points, the interview and video data show collectively that Cecilia largely offloads the agency to the textbook and uses it on an ad hoc basis. Cecilia's use of the TG is minimal. Thus, this settles her weak interaction with the material; i.e., having a non-participatory relationship with it.

Discussion and conclusion

In this paper, I present the telling case of Cecilia, a Swedish teacher, locally regarded as competent. The aim is to reveal her interaction with an imported TG from Finland when placed in her specific context. Thus, the material is sited in a new educational context. In the analysis I compare the written Finnish TG with Cecilia's actual classroom practice. The analysis is therefore combined with in-depth descriptions and snapshots of events, and is thus in line with the telling case (cf. Andrews, In press) as an attempt to make visible how she interacts with the Finnish material and how this interaction may have affected her classroom practice.

First, how does Cecilia interact with the Finnish material? My analysis revealed that Cecilia uses the student textbook when teaching, and that she offloads agency to the textbook. This interaction is categorized as non-participatory since it lacks intimacy. Her interaction with the TG is even weaker, and more sporadic and tacit than with the textbook, and is thus also non-participatory. When she trusts in her own knowledge and experience, improvising occurs, especially in regard to the repetition at the beginning of the introduction phase and the closure of the lesson with the blind evaluation. No adaptation was observed, since no equally embedded agency was found. Cecilia says she creates her lesson plans mentally. However, her focus is not on the entire lesson, since she only prepares the introduction phase. Even though she has chosen *FM* due to her judgment of its overall good quality, she does not seek support for teacher learning or to enhance the variety in her lessons through its recurrent activities. *Second, is Cecilia's classroom practice affected by her interaction with the Finnish material?* My analysis revealed that Cecilia's enacted classroom practice mirrors the "typical Swedish" practice, with short introductions and then individual seatwork most of the time (cf., e.g., Remillard et al., 2016). Cecilia does not keep the students together around a specific mathematical topic by using the embedded differentiation, and no concrete materials are used during these three lessons. No objectives are stated, either. These are all important parts of the cultural scripts found in Finnish TGs (Koljonen et al., under review). Thus, Cecilia's classroom practice is in contrast to those promoted by the Finnish TG. I deem that Cecilia's practice is marginally affected by her relationship with the material. This may be because it does not offer enough support for how to use it, or explain its intentions, therefore forcing Cecilia to follow the common norms of Swedish classroom practice; as well as the fact that it is challenging for teachers to change their teaching (Stein et al., 2007; Stigler & Hiebert, 1999). Further studies are needed to capture the essence of the Swedish classroom practice when using imported material.

My conclusion is that the use of the originally Finnish material has not had the intended impact on the practices as promoted by the guides. Instead, Cecilia uses and confirms her preexisting culture

rather than the intended one as in the Finnish TG (cf. Davis, Janssen & Van Driel, 2016; Stein et al., 2007; Stigler & Hiebert, 1999). One possible implication of this is that it may be hard to implement material from other educational contexts, even if it is quite similar and is assumed to change or even improve the quality of teaching. Yet without targeted support for how to use new material it is hard, even if a teacher is regarded as competent, to independently conduct changed or improved teaching and simultaneously maintain or gain pedagogical autonomy. This is especially important since the Finnish material lacks educative support and, thus, is not regarded as educative material (Hemmi, Krzywacki & Koljonen, 2017; Koljonen, 2014). I argue that this requires that teacher materials be included in professional development programs, as previously argued for by Ball and Cohen (1996), in order to proficiently convey and highlight the principles of the materials and adjust them to the new context that is underpinned by the social and cultural practice. It remains to be seen whether subsequent case studies of the other teachers in the larger project reveal whether the above-mentioned tentative conclusions hold for the larger data set.

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