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# Sharing and developing knowledge products from Learning Study

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## Abstract

**Purpose** – It has been proposed that lesson study creates joint and sharable knowledge products in terms of lesson plans that could be used and developed by other teachers in other school contexts (Morris & Hiebert, 2011). The purpose of this paper is to report on a study with the aim of examining how such a knowledge product produced in a Hong Kong School could be communicated and appropriated by a group of Swedish teachers.

**Design/methodology/approach** – A report from a successful Learning Study -- a revised version of lesson study, based on a theoretical framework of learning -- was brought to a group of three teachers. On the basis of this report, they planned and conducted two lessons in their own classes. The analysis draws on data from three of six video recorded lessons and was framed within a variation theory perspective. The focus of the analysis was on the object of learning.

**Findings** – It was found that the Swedish teachers used the documented Hong Kong lessons as a resource. They adapted the insights gained by the Hong Kong teachers to the specific group of learners and other conditions in the Swedish context.

**Originality/value** – The article is a contribution to the discussion about teachers as knowledge producers (c.f. Stenhouse, 1981).

**Keywords** Teacher Research, Practitioner Research, Knowledge Creation, Variation Theory, Learning Study, Instruction.

## 1. Introduction

In an article in *Educational researcher*, Morris and Hiebert (2011) propose a system that centers on the creation of shared, changeable knowledge products as one way to solve the problem of variation in educational quality from one school to another. They suggest the Japanese lesson study (Yoshida, 1999) as an example of such a system in education. A lesson study, they argue, creates joint and shareable knowledge products in terms of lesson plans which could serve as a resource for other teachers. However, how specific is such a knowledge product to the school culture? How do ‘other teachers’ appropriate a lesson plan produced for quite different conditions? In this paper we will report on a study with the purpose of examining how such a ‘knowledge product’ produced in one context could be

communicated, shared and adapted to a new classroom context. A group of Swedish teachers made use of and improved an instructional product developed in a school in Hong Kong. The approach used by the teachers there was a refined version of a lesson study, called a Learning Study (Runesson, 2008; Lo, Chik, and Pang, 2006; Marton, and Pang, 2003; 2006). The knowledge product was not a traditional lesson plan but a description of features of the topic taught that they had identified as being necessary to bring out to the learners in order to enhance learning.

## **2. Lesson and Learning Study - some similarities and differences**

Both the Lesson and Learning Studies are cyclic processes of planning and revising lessons. That is, setting a learning goal, reflecting on previous experience, consulting the literature, teaching the lesson in a natural setting with other teachers observing, analyzing the lesson from the point of view of how the learning goals were achieved and revising the lesson on the basis of this. The new lesson plan is then developed and implemented in a new class with new learners. What is then specific about a Learning Study?

One significant feature of a Learning Study is that the approach is based on an explicit theoretical framework which has implications for the focus of the process, as well as for what comes out of the process -- the knowledge product. The theoretical framework underpinning Learning Study is variation theory (Marton & Booth, 1997; Marton, and Tsui, 2004). It is used as a framework to guide pedagogical design for improving classroom teaching and learning (Lo & Marton, 2012). The standpoint of variation theory is that learning is the learning of *something*; thus learning has an object (Marton and Booth, 1997; Marton *et al.* 2004). To experience an object of learning in a certain way, one must be aware of all its critical features and be able to discern them at the same time. Lo and Marton (*ibid.*) argue that when students fail to learn, this is due to an inability to focus on the critical aspects or not focus on all of them simultaneously and be aware of how they are interrelated. For every object of learning and every learner, they argue, there are critical features the learner must discern, which necessitate the exploration of the features of the objects of learning and students' learning. In other words, what is critical for students' learning cannot be found by inquiring into the subject matter alone. The finding of the critical features must be related to the learners. Therefore, the process starts with carefully mapping students' learning by some kind of 'pre-test'. On the basis of the learners' different ways of understanding and difficulties, the tentative critical features are identified.

Next, the teachers have to consider how to make the critical features possible to discern in the classroom. Here they are guided by the variation theory which states that discernment stems from an experienced variation of the feature in question. When a feature varies against a stable background, it is likely to be discerned. If two things are contrasted with one another, it is made possible to differentiate them. So, when the teachers in Learning Study plan for how to handle the object of learning and bring out the critical features in the lesson, they apply the principles of variation and invariance. In this way the theoretical framework serves as a guiding principle for designing tasks and other means for constituting the object of learning in a systematic and conscious way (Lo & Marton, 2012).

Marton et al. (2004) and Lo and Marton (2012) describe four types of patterns of variation; *contrast*, *separation*, *generalization* and *fusion* (p. 16). They argue that experiencing contrast is a fundamental for learning. In order to know what something is you must know what it is *not*, for instance 3 is not the same as 4. However, to realize that three appears in varying forms (e.g. three cats, or 3 kilograms) ‘three’ must be separated from its appearance (e.g. ‘three’ is not connected to cats only). This separation could be made by, for instance, keeping the number invariant and varying the objects in order to help the learner to disregard the irrelevant factor. In this way *generalization* is made possible. And if you want the learners to take both various numbers and various ‘appearances’ into account at the same time, these should probably vary at the same time. This Marton et al. calls *fusion*. Hence, these principles could be used as a means for structuring the topic in a way that draws the learners’ attention to the critical features.

In a lesson study the knowledge product is a lesson plan (Morris and Hiebert, 2011). From the reading of the literature, our understanding is that this is a rather detailed plan that entails teacher and student actions, learning activities and anticipated student reactions (Arani et al. 2010; Lewis, 2002; Yoshida, 1999; Yoshida and Fernandez, 2004). The lesson plan is an instructional product that should guide “actions towards helping students achieve the learning goals” and present “the shared knowledge about how best to do so” (Morris & Hiebert, 2011, p. 8). Furthermore, it is created around a specific learning goal and is detailed enough to directly affect practice (ibid.). These are features that the Lesson Study and Learning Study have in common. However, as a consequence of the specific theoretical framing of the Learning Study, some features of the knowledge product are different from that of Lesson Study. The main difference is that the knowledge product of a Learning Study is a description of the object of learning in terms of those features that were found to be necessary for the

students' learning, hence the critical features. In addition to such identified critical features, the knowledge product of a Learning Study also describes how variation was used as a means of bringing these critical features out in the lesson and making them discernible. In this way, the knowledge product of a Learning Study is not a lesson plan in the full sense of the word, but more like a lesson design in terms of "the pattern of variance and invariance of the critical features it contains" (Kullberg, 2010, p. 35).

The aim of this study was to explore if such a knowledge product is possible to communicate to teachers, in another school context, but without the teachers undertaking a full Learning Study cycle. Hence, we wanted to know how such a knowledge product is appropriated, i.e. if it can be shared with and useful to others. The particular research questions addressed were:

- How was the knowledge product of a Learning Study, i.e. a description of a lesson in terms of critical features and pattern of variation and invariance, appropriated by a group of teachers in a new context?
- What adjustments of the knowledge product to the particular context did they make?
- How were the descriptions of 'critical features' and 'pattern of variation' enacted in the lesson?

### ***3. Method***

In order to examine how a knowledge product produced in one context may be used in another contexts, documented results from two successful Learning Studies about enhancing pupils' creative writing skills, carried out in Hong Kong, were brought to two groups of Swedish teachers. Here we report on the analysis of data from one lesson given by one of these groups.

#### **3.1. The point of departure of the study**

In the Hong Kong Learning Study, four classes in primary three in two government aided primary schools (137 pupils, 8 years of age) taught by four teachers participated (Cheung, 2005). Variation theory was introduced by the researcher to the teachers as a "possible tool for developing a powerful lesson plan" (ibid. p 102). They followed the usual cyclic process of a Learning Study, i.e. planning, implementing, observing and revising the lesson. The object of learning was to enhancing students' creative writing. The Learning Study had been

documented in an extensive research report (Cheung, 2005). Since the overall aim of the present study was to examine if a lesson plan could be communicated in terms of theoretical notions like ‘critical features of object of learning’, ‘variation’ and ‘invariance’, a summary was first made of the significant features of the Learning Study. This roughly covered one A4 sheet of paper and comprised the Hong Kong setting (primary 3), the object of learning (to enhance pupils’ creative writing), but first and foremost it described the critical feature that had been identified: *the awareness of the ‘causal sequence of the events’* and how that feature had been opened up as a dimension of variation (dov) in the lesson by giving the pupils a set of six separate pictures and asking them to compose a story with a causal sequence. This had given them the opportunity to arrange the sequence in different ways. In the summary this was presented in the following way: ”In the lesson, a pattern of variation was created by keeping the number of parts (the pictures) invariant, while the sequence could be different thus, varied”. Finally, the six pictures had been decomposed into three groups of two pictures each. Thus, a sequence of six component parts had been contrasted with a sequence of three (the component parts of the story had been opened up as a dimension of variation). The six pictures were given in the supplement in the documentation. The pupils were also allowed to act out the stories, by means of creative drama. Apart from this, there were no other descriptions of teaching arrangements or organization of the lessons.

### 3.2. Participants in the Swedish study

When selecting the Swedish participants, our intention was to find a group of teachers teaching the same grade, in a corresponding school and with a similar experience of Learning Study and variation theory as their counterparts in Hong Kong. So, the Swedish teachers taught primary 3 (Note, the Swedish pupils were one year older) in a Swedish compulsory government aided school. These teachers were selected for this study since the researchers knew that they were interested in school development. They were experienced teachers with 12 to 32 years of teaching experience, teaching pupils from grade 1 to grade 7. They were all female. In Sweden, primary school teachers teach (almost) every subject, hence the participating teachers were not subject experts. They had not participated in a Learning Study before. Before the study started they had attended five seminars (one and a half hours each), three of which were a series of lectures about variation theory held at the university by one of the authors of this paper. In the other two seminars an article reporting previous Swedish

Learning Studies was studied. Particular attention was drawn to how variation had been used in those studies as a means of bringing out features critical for student learning. In order to make them more familiar with the idea of how variation theory could be used as a guiding principle of pedagogical design, they were encouraged to reflect upon their teaching experience from the point of view of variation theory and come up with examples when they (perhaps unconsciously) had applied the principles of variation and invariance as a pedagogical tool previously. However, at this stage they did not know anything about the content they were going to teach in the study. In what ways they had perceived the theoretical framework via these seminars, is not possible to say.

The teachers were informed that we wanted them to conduct two lessons on ‘creative writing’ based on the documentation of two previously conducted lessons in Hong Kong. We told them that they should plan the lessons together with us (the authors of this paper) but were free to plan on their own as well, but that we wanted them to conduct a pre- and post-lesson test. We emphasised that the documentation was not a lesson plan they had to follow, but a description of the principles that the lesson was based on, framed in theoretical terms, and they were free to adjust them to the particular situation and pupils. They could make any changes they found necessary compared to the Learning Study documentation in order to reach their goal: to enhance creative writing.

The school was located in a small town in the south of Sweden. All students had a Swedish ethnic background hence, they were all native speakers. Three classes (42 pupils, aged 9) whose participation was optional took part. The parent(s) of the participants had given their written consent.

### **3.3. The role of the researcher**

Although the role of the researchers was mainly to communicate the knowledge product, their influence cannot be neglected. It has been pointed out by Adamson and Walker (2011) that collaboration between teachers and researchers is not easy as some tension may occur. For instance, tension arises due to differences between insider and outsider perspectives and an unclear hierarchical structure. The expertise of the researchers did indeed differ from that of the teachers. For instance, the researchers were more familiar with the theoretical framework, whereas the teachers had a deep understanding of the classroom context and the learners. In order to resolve the dilemma of varying power and expertise, we were explicit about the ownership of the study being in the hands of the teachers in terms of making the decisions

about what to teach, about the lesson plan and the enactment of the lesson; their decisions had to be final. So, the researchers were concerned to intrude as little as possible in the teacher-designed and teacher-led process. To minimize the influence of the researchers, the teachers were encouraged to have some of the planning sessions on their own. When the video recordings and the recorded planning sessions (in the presence of the researchers) were analyzed, it was found that much of what was implemented in the lessons was not discussed at all or in much detail in these sessions. Thus, some ideas were probably generated by the teachers alone.

### **3.4. Design of the Study**

The study reported here is a part of a larger study where one of the overarching goals was to put variation theory into test. This comprised testing if a lesson plan, in terms of descriptions of critical features, produced in one context, could be communicated to teachers in a different school culture.

The Swedish study was not a Learning Study in a regular sense, since the cyclic process did not take place (Figure 1). Still it had some similarities; the teachers planned and shared the experience of the lessons together on the basis of the results of the pre- and post-lesson tests. Two meetings with the researchers took place before the lessons. In these meetings the aim of the study was presented and the documentation from the Hong Kong Learning Study was interpreted and discussed, and the pre-test was decided on and analysed. Particular attention was paid to the documented critical features and to the pattern of variation and invariance the Hong Kong teachers had used as a means of bringing them out, hence these discussions were framed within a variation theory perspective. Some of the pre-lesson meetings were held without the researchers (and thus not recorded). The group (and the researchers) met after the first lesson to share experiences from lesson 1 and to plan lesson 2 also (See figure 1). All meetings where the researchers were present were audio-recorded. One of the researchers video-recorded the lessons and helped with other practical arrangements.

[Insert figure 1 about here]

### **3.5. Data and Analysis**



The lessons given in the two schools were based on two different Learning Studies. For the research project as a whole, data from pre- and post-tests were also used but are not reported here. This paper describes only the data from lesson 1 given to three classes in school B and the corresponding pre-lesson meetings: in total 7 hours of audio-recorded meetings and three video-recorded lessons of 60 minutes each. The data were analyzed to gain insights and address our research questions. We analyzed how the object of learning was dealt with in terms of features brought out by means of patterns of variation in the lessons. The video recordings were coded according to instances in the lessons when particular features of the object of learning were present in the lessons. Some of these instances were transcribed verbatim and analyzed in detail. The analysis focused on how the documented lessons were used as a resource and adapted to the Swedish context; what was similar to or different from the reported Learning Study. The very close analysis of the video-recorded lessons was framed by variation theory, specifically how the *object of learning* was enacted in the lessons. What features of the object of learning to write a story were exposed to the learners and, consequently, possible to learn? This means that we noticed how various dimensions of variation were opened up in the lessons by examining what was kept invariant and what was varied. These patterns of variation and invariance were classified according to notions of *contrast*, *separation*, *generalization* and *fusion* (Marton, Runesson *et al.* 2004). Following their claim (*ibid.*) that what is varied is likely to be discerned, we were able to describe what was made possible to learn in the lessons. Finally, the analysis of the Swedish lessons was juxtaposed to the documented Hong Kong lessons to reveal similarities and differences in respect to features of the object of learning and patterns of variation and invariance.

#### **4. Results and findings**

In this section we will describe how the Swedish teachers adopted the knowledge product from Hong Kong in their planning and in the enactment of the lessons by giving an account of what features that were present, how they were opened as dimensions of variation and in what way they were similar to what was reported from the Hong Kong study.

##### **4.1. Adopting and adjusting the documented experiences from Hong Kong to the Swedish context**

In the pre-lesson meetings, the documentation was discussed in relation to the Swedish context; what was needed to enhance the pupils' story-writing skills? Did the Swedish pupils have the same problems with causal sequencing of the events, or were there others as well? The researchers suggested using a picture as a pre-test and instructing the pupils to write a fictional story connected with the picture by imagining what would have happened before and after the event in the picture; this the teachers agreed to. When pupils' stories were analyzed by the teachers and the researchers together, it was found that they differed with respect to the causal sequence of events. This meant that some of the Swedish pupils had the same difficulties as their counterparts in Hong Kong. However, the analysis showed something else; often a plot was missing in the stories. They had no main event following an introduction, and sometimes no resolution. The teachers also found that the pupils rarely used dialogue in their writings and that the title of the story was too often irrelevant or not attractive enough. They therefore planned the lessons with these things in mind.

#### 4.2. The enactments of the object of learning

As mentioned earlier, in connection with how the lesson in the Learning Study was arranged, it was documented that six pictures had been used for sequencing events and that the story had been acted out by the pupils. So the teachers were at liberty to choose the organization, material, and tasks and make any other arrangements they thought necessary for the lesson.

In all three lessons, both pair work and plenary discussions were used when sorting the six pictures (from the Learning Study) to make up a story. The pupils arranged the pictures in sequence and told a story related to them. When we analyzed how the object of learning was enacted, we found that in some respects the Swedish lessons (SwL)<sup>1</sup> corresponded with what was reported from the Hong Kong Learning Study (HKLS) (Cheung, 2005), but in other respects changes were made as to what dimensions of variation were opened up in the lessons (see table 1). In the following, we will describe the enacted object of learning in terms of features opened up as dimensions of variation and what patterns of variation were created in the SwL. The same objects of learning were enacted in all three lessons. However, they differed slightly as regards how the critical features were brought out and the pattern of variation created.

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<sup>1</sup> SwL and HKLS refers to the Swedish lesson and the Hong Kong Learning Study respectively.

[Insert table 1 about here]

#### *4.2.1. Identical features and dimensions of variation: Causal sequence of events and component parts.*

We found that some things in the SwL were very close to features documented in the HKLS. Just as was documented from the HKLS, the feature the ‘*causal sequence*’ of a story was exposed in the lesson and opened up as a dimension of variation when the six pictures were ordered differently by the pupils. Subsequently, different narratives were told by the pupils by different groups and presented on the board in plenary. So the same pattern of variation documented in the Learning Study was implemented in the Swedish classrooms (events/pictures invariant, sequence and narrative varied).

Another similarity to the HKLS was that the six pictures were reorganized and grouped into three groups of two. The teacher decomposed the story previously presented, which consisted of six separate events/pictures, into three component parts. Hence, the teacher introduced two ways of structuring the same sequence of events. In this way, a one-dimensional sequence was turned into a two-dimensional. By contrasting a one-dimensional sequence (six pictures) with a two-dimensional one (two groups of pictures), ‘*the component parts*’ of a narrative were opened up as a dimension of variation; the instance (the narrative) was invariant, the structure varied. Instead of just seeing the narrative as six separate events (first this happened, then this...and so on), an alternative way of seeing was introduced. Thus, the pupils were given the possibility of seeing the same narrative as comprising six or three parts.

However, the analysis revealed that there were other, and thus unique, features brought out in the SwL that were not described in the documentation from the Learning Study.

#### *4.2.2. New and unique features and dimensions of variation I: The plot structure.*

Right at the beginning of the Swedish lessons (before the sequencing of the pictures was discussed), all three teachers sketched a curve on the board, illustrating the plot-structure of a narrative (figure 2). If this happened in the Learning Study, we do not know; at least it was not reported.

[Insert figure 2 about here]

The teacher pointed to the curve and explained that in the introduction of a narrative the characters and the setting are presented (pointing to the first raising part), followed by the main event – saying: “could be a problem or something dramatic” – (pointing to the ‘peak’) and a final (e.g. “the problem is solved”). Hence, the component parts of a narrative (introduction, main event, resolution) were used to describe the structure of a story. No particular narrative was used as an example. In other words, no reference was made to a narrative.

In this situation, in two of the classes, something probably unplanned happened. The pupils commented on the look of the curve by referring to books they knew and said that these had a different structure. For example, one pupil in Karoline’s class made the following remark.

[Excerpt 1 Karoline L1: 5.22]

P: That, when I read [title of a book, inaudible] then, at the beginning, it was very exciting at the beginning.

The teacher picked this up, continued and drew another sketch on the board (figure 3)

T: Well, it could be like you said, it’s very exciting at the beginning and then one tells a bit about what’s happened and then this bigger event comes and then there’s a finishing. But often the first part is not so long, it’s more to catch the reader’s interest. But a story needs some [with emphasis] event which makes it interesting.

[Insert figure 3 about here]

The teacher did not disapprove of what was said, but emphasized that the narrative must nevertheless have a ‘plot’. She said: “The narrative needs *some* event which makes it interesting.” She continued by giving examples of other books and explained that what they all had in common was that there was a main event (“exciting or funny”). In this case, a pattern of variation/invariance Marton *et al.* (2004) call generalization was created. This implies that *‘the plot structure’* is separated from the particular instance (i.e. the narrative). Hence, it was possible to notice that the structure was the same although the narratives could be different. This means that the pupils were taught that *the plot-structure* is a common feature of a narrative. This feature was not documented as being present in the HKLS. Thus,

we interpret this to be unique to the SwL and implies an expansion compared with the documented HKLS.

As described above, just like in the HKLS, it was demonstrated that the component parts of the story could be six or three. However, when this feature was exposed in SwL it was combined with '*the plot-structure*' of the story. In all three lessons, after different ways of sequencing the events (pictures) had been discussed and the events had been decomposed into three component parts (see above), the pictures were stuck onto the curve illustrating the plot-structure (figure 2). The teacher pointed to the curve and said:

[Excerpt 2 Alice L1 40:00]

T: This is the start. Do you agree?

Ps: Yes.

She continued:

T: This is the beginning of the story (sticks two pictures on the rising part of the curve). Then we've got the peak here (sticks two pictures on the peak of the curve). Then it bursts here, doesn't it? Then a solution of the problem, to make her happy. There we are going down ...then we have the ending (sticks the last two pictures on the curve).

In this way the teacher demonstrated, not just that a narrative could be seen as a one- or a two-dimensional sequence (as was described above) but also that the sequences made up different component parts with different functions. The two first groups of pictures made up "the beginning of the story", the next "the peak ("It bursts here") and the last, the resolution ("Then a solution of the problem, to make her happy"). Thus, the teacher demonstrated that the component parts had different functions in a story when the previous general plot-structure was related to a particular (and familiar) story. Two features ('component parts' and 'plot-structure') were brought together. This we interpret as yet another expansion of features in the SwL. In the HKLS it was only taught that the story could be seen as consisting of three (or six) parts. In SwL, the meaning of the feature 'component parts' was extended when it was combined with the feature 'plot-structure'. This enabled the pupils to learn what function the different parts had as well.

#### *4.2.3 New and unique features and dimensions of variation II: modes of telling.*

It was found that the Swedish teachers used the activity reported in the Learning Study documentation but with another purpose. The teachers instructed one half of the class to act out the story as a drama, the other “just to tell it”. The pupils worked in groups and performed in front of the class. The two modes of telling were compared; the teacher asked which performance they thought was the most amusing; telling or drama. One pupil preferred drama, since “just telling is not exciting”. The teacher challenged this by comparing the advantages of the two modes:

[Excerpt 3 Karoline L1 48:00]

T: What can I do when I'm telling...That I can't do when I'm writing a dialogue? What's good about telling?

P: Could describe so you will get images in your mind.

P: You cannot tell what somebody looks like in a dialogue.

T: What's good about writing a dialogue? Listen: “Bang!!” it said when the balloon crashed. Which one has the best effect?

P: How something sounds and what somebody says.

The two modes were brought together when the teacher asked which version they would prefer to read if it was written down (thus, not acted).

[Excerpt 4 Joanna L1 46:50]

T: [what do you prefer] a story as a dialogue, they just talk to one another, or the one with telling only? Would it be better as a dialogue or as telling only? Or could it be something different?

Several pupils spontaneously said they preferred a mixture.

P: A mixture.

P: A mixture.

P: A mixture.

T: Raise your hands, please, so everyone gets a chance to think about it. Why?

P: Sounds better. I like that.

P: Mixture.

T: Johan?

J: Think it's better if you could see what they are doing.

T: But... let's imagine it is a book instead. Then...then maybe it's better with a mixture.

P: [Inaudible]

T: Right. So you mean if there is dialogue and they just speak... if it goes 'and then he said' and 'then she said', it could be boring?

In this situation the variation of three modes of telling (just 'telling', acting, and a mixture of them) was exposed to the pupils. By varying the mode and keeping the story invariant, the mode was separated from the story. Thus, the pupils were given the opportunity to experience that the same story could be told as a dialogue, or by just telling, or by mixing them.

This example illustrates how an activity reported in the HKLS-documentation was used as a resource by the Swedish teachers. However, it was transformed when it was brought into the SwL. Whereas in HKLS the activity was used just for reporting the story the pupils had composed of the six pictures, in SwL it was used for contrasting two modes of telling. Thus, the same activity had different functions in the two classroom contexts. The use of creative drama in the SwL became a means of eliciting ways in which a story could be presented. This implied that another and, compared to the HKL, unique feature of a narrative was taught in the SwL; that a story could be told in different modes. By contrasting different presentations, the teachers were able to bring out a particular feature; *'modes of telling'* the story to enhance pupils' story-telling.

#### *4.2.4. New and unique features and dimensions of variation III: appropriate and attractive title.*

Yet another feature possible to learn in the SwL, but not documented in the HKL, was identified. For technical reasons data are missing from this part of the lesson in one of the classes, but the other two lessons were similar in that the teacher presented criteria for a good title to the story. It should be "not too long", "tempting, so you want to read" and "not reveal too much". These were written up on the board. After that, the pupils were asked to come up

with suggestions for titles to the story previously told. These were written up on the board also and the pupils were asked which one they preferred. Their opinions varied. The teacher did not value or show any preference to any of them. So, in this lesson the pupils were exposed to the idea that the same story could have different titles.

However, in one of the lessons, the feature ‘appropriate and attractive title’ was expanded when a pattern of variation and invariance was created in relation to the criteria for a title also. This was largely due to comments from the pupils. When they were told that a title should be ‘short’, one pupil commented by mentioning a book which he thought had a long title. The teacher said:

[Excerpt 5 Karoline L1 tape 2 0.10]

T: Yeah, those books [series]..the title is long.. that one says a lot. But mostly the title is short.

The teacher then asked the pupils to discuss in pairs and come up with a title to the story that fulfilled the criteria.

T: Come up with a title which is short, tempting and doesn’t reveal too much.

Pupils’ suggestions were written on the board: “The balloon”, “Monday with Suzy and Adam”, “The bang”, “The balloon pause”, “The exploding balloon”, “The balloon chaos”. The teacher related them to the criteria; none of them were too long or revealed too much. However, were they tempting?

[Excerpt 6 Karoline L1 tape 2 7:33]

T: If I didn’t know what the story was about, what would I choose? ‘The balloon’? What thoughts do I get? ‘Monday with Suzy and Adam’?. What thoughts do I get? ‘The bang’? What thoughts do I get? ‘The balloon chaos’?... ‘The exploding balloon’?... There are probably others. But a title should be tempting, you don’t know exactly what happens ... what it is about? That’s the way it is.

Now, without being addressed, one pupil added another title. She just said:

P: One Monday when everything happened.



P: What?

The teacher picked this up, and said:

T: Say it again, louder, please.

P: One Monday when everything happened.

The teacher wrote this on the board and said:

T: If we compare 'One Monday when everything happened' to 'Monday with Suzy and Adam'. Which one is most tempting to read?

P: 'One Monday when everything happened'.

T: Yes, 'One Monday when everything happened'.

One pupil disagreed.

P: 'Monday with Suzy and Adam'.

P: I would choose that one.

The teacher commented on this by saying:

T: And here...It is different. We could think differently about that.

Again we could see how the use of patterns of variation played a significant role in bringing out the feature 'an appropriate and attractive title'. From excerpt 5 we can see that variation was used when it was shown that the same story could have different titles (the title became a dimension of variation). However, a closer look at the excerpts reveals that the variation created here is rather complex in terms of how the feature 'appropriate and attractive title' is brought out. It was not only a variation of possible titles to the story that became a dimension of variation. Even two of the criteria for a good title were exposed as dimensions of variation. One of them was the criterion '*length of the title*'. One of the pupils referred to a book which he thought had a long title. Thus, he remarked that the length of the title *could* vary.

The other criterion that was opened as a dimension of variation was '*tempting, so you want to read*'. From the excerpts we could also see that both an explicit and an implicit variation was created when this criterion was discussed. What do we mean by that?

When the teacher said: "The balloon? What thoughts do I get? 'Monday with Suzy and Adam'? What thoughts do I get? 'The bang'? What thoughts do I get?" she pointed to the

different titles (these were explicitly varied). However, the pupils never got to express what they associated with each title. That implies that an explicit variation (different titles) together with an implicit variation (different associations) were exposed at the same time. In this way, it was demonstrated that different titles could prompt different associations, but these were not made explicit. So it was left to the pupils to decide whether the title was tempting or not. However, one of the pupils contributed an explicit variation of the criterion ‘tempting...’, when she added one title to the list of titles. This was slightly different from one of the others; ‘One Monday when everything happened’. This title we could interpret as being more tempting compared to the title ‘Monday with Suzy and Adam’ previously suggested (it promises something will happen, but without revealing exactly what will happen). Thus, by the exchange of some words, the pupil made explicit that the title could fulfill the criterion ‘tempting’. The pupil showed explicitly a variation of the meaning of ‘tempting title’ quite different from the variation created by the teacher.

### ***5. Conclusions and discussion***

The point of departure was a Learning Study, in which a group of teachers in a systematic inquiry into their classroom practice had gained insights into aspects critical for learning ‘creative writing’ These were documented and communicated to a group of Swedish teachers, working in a quite different school culture and with other conditions. In order to study in what ways results from a *Learning Study* can be communicated to teachers in another school context and how these could be used and manifested when enacted in the classroom, we have studied three lessons conducted by three teachers in different classes. The analysis was focused on that which was jointly constituted by teacher and learners in the classroom and particularly what features of the object of learning were exposed in the lesson by the introduction of variation. We used the documented HKL as a reference to examine how the Swedish teachers made use of the results and what changes were made. We would suggest that the knowledge product, created in the Learning Study and framed and described in theoretical terms related to a particular object of learning, was possible to communicate to Swedish teachers. They could make sense of the specific theoretically grounded description of the lesson, adapt and adjust it to the specific context. The analysis of the lessons also demonstrated how they applied the theoretical framework in the enactment of the object of learning.

If you look at the study critically however, several issues emerge. One of the overall aims of the project was to examine if results from a Learning Study could be of use and developed without having to implement a full Learning Study cycle. Although some elements of a Learning Study (e.g. pre- and post-test and joint planning) were present, the iterative process was not implemented in this study. If this had been the case, the result might have been an even more developed lesson plan, since the teachers would have had the possibility to get feed-back from pupils' learning and from variation in the implemented lessons. By this, they would have been able to adapt, revise and refine the lesson design further on the basis of the learning outcomes and observations of the lesson.

We strongly believe that it is important to document results from Learning and Lesson Studies so that it can be a foundation to build on in the future. However, what format is best for such documentation? The 'knowledge product' used in this study differs from the knowledge product created in a Lesson Study. From the point of view of dissemination and improvement, what are the advantages and disadvantages of these different ways of reporting? A lesson plan in a regular sense gives detailed descriptions of activities, questioning, tasks and so on, whereas the lesson plan used in this study was more of a theoretical description; i.e. of features identified as necessary to discern and the pattern of variation implemented in the lesson. Although it does not necessarily need to be a script that must be followed, the former gives the teacher more direct guidance to the lesson. There might be a risk that the regular lesson plan is followed technically and without reflection by the teacher. However, in the same way, there could be a risk, we would admit, that the results of a Learning Study could be used in a technical way also; teachers might use them as a ready-made prescription or a common list of features critical for learning. The lesson design used, as it is documented in this study, put greater demands on the teachers. They had, for instance, to consider and decide on the sequence of the lesson, the questions, the organization of the lessons and some of the activities themselves. Besides this, since the lesson plan was described within a theoretical framework, it required, probably, that the teachers were familiar with the underpinning theory.

In this study the teachers had some familiarity with variation theory. In what ways the lesson plan would have been used by teachers who are not familiar with variation theory is not possible to say since this study has not covered this aspect (a research design with a control group might have shed light on this issue). Although notions such as critical features and dimensions of variation, variance and invariance are theoretical and general, the descriptions

related to a particular object of learning are specific. Descriptions of critical features like, ‘causal sequencing of events’ and ‘component parts’ are probably specific and tangible enough to understand without being familiar with variation theory. Furthermore, specific descriptions of patterns of variation in terms of what was kept invariant and what was varied might not require a deep understanding of variation theory. However, *why* features might be critical and the rationale for opening them up as dimensions of variation (not just telling them) may require some understanding of the theoretical framework.

Morris and Hiebert (2011) suggest that the dissemination and improvement of the knowledge products of Lesson Study could be a way to overcome variation in classroom learning opportunities. However, classrooms, learners and teachers differ. The classrooms in this study were in several respects different from the classrooms in Hong Kong where the lesson design originated. Nevertheless, it appears that the Swedish teachers, to a certain extent, could benefit from insights made in a totally different school culture

One could ask if there is a risk that the use of knowledge products produced elsewhere would restrict the interactive character of a lesson, that the teacher would be governed too much by the documentation and might lose her/his sensitivity to the unplanned and unexpected. Our conclusion is that the knowledge product from Learning Study was used as a resource when planning the lesson in the new context. It is our interpretation that this served as a model or a prototype for the Swedish teachers. It informed them and made them aware of features that may be of importance for enhancing learning. It seems to have given them a direction or guidance for the planning and enactment of the lesson, but not an explicit plan for the lesson to follow. The documented HKLS was not implemented directly, but adopted and adjusted in relation to the specific conditions. As described previously, the Swedish teachers added new and unique dimensions of variation to ones that had been identified as critical for learning in the HKLS and exposed the pupils to them in their lessons. This implies that they expanded the *enacted object of learning* compared with the teachers in HKLS, which is in line with what has been suggested by Morris and Hiebert (*ibid.*), who particularly point out that the lesson plan is not a fixed product but open to other teachers to test and improve upon. If this happened due to the rather ‘open’ lesson plan (in terms of being not so detailed about activities, arrangements and organization), we can only speculate about. It might be the case that the very focused description of critical features and patterns of variation and invariance drew the teachers’ attention to specific characteristics of the lesson.

Finally, knowledge produced in a Learning Study is not a canon for best practice, neither is it a prescription for effective teaching or evidence-based practice, but a description of those features that have been found critical for a particular group of learners' learning of a particular object of learning. We argue that pedagogy should not be seen in terms of technology, and that classroom teaching and learning are very much an interactive activity. This is also indicated by this study; although the teachers had planned the lessons together, they were not identical in all respects. The interactive character of the classroom was demonstrated in the way the students contributed to the space of learning also. Still, our interpretation is that the 'product' of a Learning Study is sharable and dynamic, and can therefore be changed and developed.

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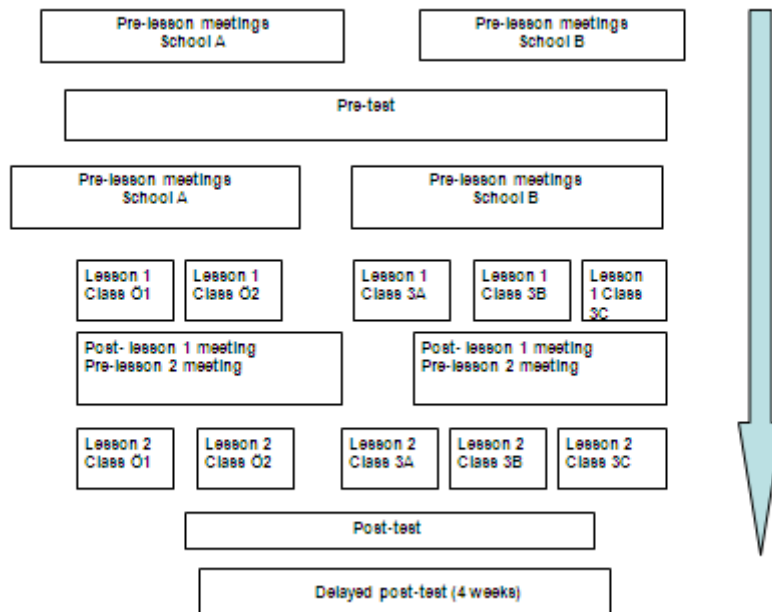


Figure1. The design of the study. Note! This paper reports findings from school B (three classes) and lesson 1 only.

Table 1. Dimensions of variation (dov) opened up in the lessons documented from the Hong Kong *Learning Study* and analyzed in the Swedish study. *Italics* indicate new and unique additions to dov.

|  | <b>Features opened up as dov in the lesson</b>  |
|--|---|
| <b>Hong Kong (Documented from learning study)</b>                  | -Causal sequencing of events<br>-Component parts  |
| <b>Sweden (Identified from analysis of video-recorded lessons)</b> | -Causal sequencing of events<br>-Component parts<br><i>-Plot-structure of a narrative</i><br><i>-Modes of telling</i><br><i>-Appropriate and attractive title</i> |



Figure 2. A curve illustrating the plot-structure of a narrative.

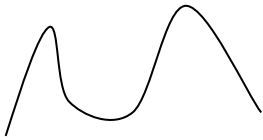


Figure 3. An alternative plot-structure of a narrative introduced by one pupil.