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Guided reflection as a means to demonstrate and develop student teachers' reflective competencies

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The purpose of this paper is to explore the ways in which the reflection presented in student teachers' teaching practicum contributes to the development of their professional knowledge. The paper addresses the task of investigating the quality of teacher reflection in its guided forms. By using the procedures of guided reflection, this paper builds a conceptual account with which to structure and describe the forms of reflection presented in student teachers' reflective talk. Based on our results, there is a need to investigate more closely what creates changes in teachers' knowledge and what kind of reflective processes can contribute to such changes. We hope that the procedure of guided reflection opens new opportunities for studying the development of teachers' professional learning.

Introduction

This article explores teacher reflection as both a method and a purposeful inter-subjective process. Some of the current theoretical underpinnings of reflection, with particular attention to its systematic forms, are examined. It is suggested that reflection guided by the use of the stimulated recall method provides an effective way to foster teachers' ability to reflect on teaching. With the aid of a framework for guiding reflection, this article suggests some implications for teachers' education and professional development of using reflection.

Our study adds two perspectives to the discourse on teacher reflection. One is a critical examination of the concept of reflection as a possible source of pedagogical knowledge. The other is an effort to foster teachers' professional development with the aid of reflective tools. These two perspectives have been used separately in educational literature: for example, Lynch (2000), Korthagen (2001), and Fendler (2003) have argued against the imprecise use of the concept of reflection, while Smyth (1992), Valli (1992), Osterman and Kottkamp (1993) and Loughran (2002) have criticised the lofty rhetoric of teacher reflection that promises teachers genuine professional development in their practical work environment. However, these two perspectives have rarely been brought together in research on teacher reflection.

Our goal is to foster teachers' ability to reflect on their teaching and thereby improve their professional knowledge and its development. This article examines the quality of student teachers' reflection and the inferences drawn from this process by addressing the following research questions:

- (1) What forms of reflection do student teachers' reflective thinking consist?
- (2) How are those forms of reflection divided among the procedures of guided reflection?

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Teacher reflection: promises and pitfalls

A great deal of educational research portrays reflection as a wholly beneficial practice for teachers. According to this view, teacher reflection promotes critical approaches to teaching and, consequently, leads to better practice (see Oser *et al.*, 1992; Artzt & Armour-Thomas, 2001; Mayes, 2001; Swain, 1998). Reflection is commonly reported as a process of self-examination and self-evaluation that teachers should engage in regularly in order to interpret and improve their professional practices. The argument goes that by thinking carefully about what is taking place in a given situation, teachers are better able to identify the options available. It presupposes that the process of reflection highlights a teacher's conscious choices about how to act in the classroom. The concept of reflection is used vaguely in connection with teachers' minds and work: the term reflection refers to thinking in general terms (Parker, 1997). Moreover, the term reflection is often used without careful conceptualisation. We therefore seek to provide a stricter definition of the concept of reflection and also the use of it.

The concept and the practice of reflection

Reflection is frequently used in educational studies and plays an important part in teacher research, even if the concept is not always clear. As Lynch (2000) argues, the concept and the practice of reflection are interpreted in various ways:

... in some social theories it [reflection] is an essential human capacity, in others it is a system property, and in still others it is a critical, or self-critical, act. Reflexivity, or being reflective, is often claimed as a methodological virtue and source of superior insight ... or awareness (Lynch, 2000, p. 26)

Consequently, teacher reflection tends to be seen as an ideal solution to the problems teachers face when it comes to reviewing their teaching. It is often supposed that teacher reflection actually *does* something, or that *being* reflective has some sort of transformative power regarding a prior 'unreflective' teacher condition. Lynch (2000) claims that reflective analyses are often said to 'reveal forgotten choices' and 'expose hidden alternatives' (p. 36), which have been suppressed by the teachers' daily practices. Teacher reflection is thus seen as having considerable power and potential for professional development. But, as Lynch concludes, what teacher reflection can do and what it can reveal all depend upon 'who does it and how they go about it' (p. 36). Therefore, the benefits and potential of teacher reflection will largely remain unspecified until we learn more about the relevant methodological tools and their contextual applications.

Dewey (1933) reminds us that reflection is a complex, rigorous, intellectual, and emotional enterprise that takes time to do well. According to Rodgers (2002), Dewey gives us the means to look at reflection and reflective practice in a more precise way. This is done with the aid of the following four criteria:

- (1) Reflection is a meaning-making process that moves a learner from one experience to the next with a deeper understanding of the relationships with, and connections to, other (people's) experiences and ideas.
- (2) Reflection is a systematic and disciplined way of thinking. It is comprised of the following phases: spontaneous interpretation of an experience; identifying the problem(s) and question(s) that arise out of the experience; generating possible explanations for the problem(s) posed; developing and testing the explanations, and efforts to sort out, or live with, the problem(s) posed.
- (3) Reflection needs to happen in interaction with other people. This is crucial because expressing one's ideas or thoughts to others with sufficient clarity for them to understand, reveals both the strengths and weaknesses in one's thinking.

- (4) Reflection requires attitudes that value one's own personal and intellectual growth as well as that of others. Dewey (1933, p. 30) emphasised that the attitudes an individual brings to bear on the act of reflection could either open the way to learning or abstract it. Awareness of our attitudes and emotions is an integral part of appropriate reflective practice.

The works of Donald Schön (1983, 1987) have gained a certain status in the field of teacher reflection. He has advanced the notion of reflection by distinguishing between *reflection-in-action* and *reflection-on-action*. The latter refers to the process of making sense of an action after it has occurred, and possibly learning something from the experience, which in turn extends one's knowledge base. The former refers to the sorts of 'know-how' people reveal in their actions and which, characteristically, they are unable to make verbally explicit. However, as Eraut (1995) has argued, most of Schön's examples fail to provide evidence of reflection-in-action and none of them relate to crowded settings like classrooms. Therefore, Eraut concludes, 'it is difficult to see how one could distinguish reflection-in-action from reflection-on-action' (p. 9). They are not dichotomous opposites. Actually, reflection-in-action is frequently reflection-on-action as well. Fenstermacher (1988) has claimed that Schön offers us an 'either/or' description of a situation that is actually a 'both/and' description.

Consequently, Eraut (1995) has extended Schön's work to encompass a third reflective process, namely, *reflection-for-action*, which is anticipative by its nature. Here, the learner defines her or his aspirations and purposes for subsequent action. Teacher reflection can be seen as an ongoing process of reflection before, during, and after teaching action, revolving around the teacher's reflecting self. According to this view, reflection is a tool in the continuous construction of a teacher's knowledge. In order to interpret and understand this process of knowing, we rely on Eraut's (1995) redefinition of the key propositions of reflection where *in* refers to context, *on* refers to focus, and *for* refers to purpose. Teacher reflection is a way of relating to the world and a basis for understanding and responding to experiences.

Due to its complexity, a reflective approach is something to be learned in terms of degrees rather than absolutes. According to Luttrell (2000), being reflective is an exercise in sustaining multiple, and sometimes opposite, elements and emotions in teaching. Being reflective means 'expanding rather than narrowing the psychic, social, cultural, and political fields of analysis' (p. 516). Hence, reflection is mainly a question of fully recognising the ambivalent relationships between a teacher's perception (of a situation) and the realities studied.

Guided reflection and professional development

Teacher reflection means examining 'one's own interpretations, looking at one's own perspectives from another perspective, and turning a self-critical eye onto one's own authority as interpreter and author' (Alvesson & Sköldbberg, 2000, p. vii). Hence, the reflective approach has two basic characteristics: careful interpretation and reflection. This approach should lead to the development of teachers' professional skills. The development takes place in two dimensions: *attitudinal development* modifies teachers' attitudes to their work, whereas *functional development* means the process whereby teaching practice is considered to have improved (Evans, 2002, p. 15). These two aspects of reflection are interconnected. Thus, the reflective approach to teaching should have the potential to incorporate both the attitudinal and the functional development of teachers.

As presented before, reflection is believed to be a genuine way of fostering change in teachers' professional action. However, the problem is how teachers extract meaning from their experiences. Earlier studies have suggested that teacher reflection on a general level has not been as effective as it promised to be. In addition, the methods of teacher reflection have been

insufficiently developed to foster an encouraged and differentiated professional learning process (Reiman, 1999; Zeichner, 1996). This is because, in practice, reflective analysis does not come naturally; it requires dialogue with the help of a particular method.

Guided reflection is more than encouraging teachers to bring something to mind. According to the Deweyan perspective, actions, thoughts, and feelings must also be considered – unexamined experiences lose their potential for growth and teacher development (Dewey, 1933; Rodgers, 2002). In this study, we imply that teacher reflection can be initiated and further developed as part of the social interchange that exists among teachers. From this starting point and perspective, spoken discourse between teachers offers tools needed for reflection. By using the stimulated recall method (Patrikainen & Toom, 2004) to guide the formulation of spoken discourse, teachers can fashion their interpretations in ways that can encourage deeper reflection and, consequently, provide tools for their professional development.

A hot–cool system analysis of teacher reflection

The hot–cool system framework (Metcalf & Mischel, 1999) we employ is intended to clarify the long-lasting interaction between teaching practice and its prolonged reflection (Husu, 2003). We suggest that there are two types of teacher reflection, each with its own characteristics and interacting systems. According to Metcalfe and Mischel (1999), the *cool* reflective system is for ‘complex spatiotemporal and episodic representation and thought’ (p. 4). We call it the ‘knowing system’. Conversely, the *hot* reflective system is for quick, and often emotional, teacher action and for responding to actual teaching situations. We call it the action or ‘go’ system. This is because it is part of the teacher’s professional task to be attuned to the situational dimensions faced all the time in teaching. These ‘current concerns’ do not wait. Instead, they unfold continuously. As a result of these concerns, some kind of action is always required, even if that action is non-action. A summary of the main characteristics of these two systems (cf. Metcalfe & Mischel, 1999) is given in Table 1.

We argue that there are two types of representations of teacher reflection, one essentially emotional and fast and the other essentially cognitive and slow. The hot system deals with the kinds of responses teachers make in the classroom. The cool system is a narrative, weaving knowledge about actions, thoughts and emotions into a developing story that is coherent and goal sensitive. The hot and cool systems work in concert to produce interpretations that relate their essential characteristics to each other.

Guided reflection in practice

Our goal here is to propose a practical model for conducting guided reflection in practice. The model (in Figure 1) is based on the theoretical ideas of reflection and the implications for

Table 1. Characteristics of the hot–cool system of teacher reflection.

Hot system	Cool system
Largely emotional	Largely cognitive
Implicit	Explicit
Routines; reflexive	Reflective
Simple	Complex
Fast	Slow
Interpretations develop early	Interpretations develop late

teachers' professional development presented earlier in this article. Critical incidents and their analysis occupy a central position in this model.

Specifying critical incidents

The concept of a critical incident has been used by several authors and has been defined in various ways (see Woods, 1993; Francis, 1997; Angelides, 2001). Tripp (1993, p. 24; 1994, p. 69) states that the term 'critical incident' was first used in biographical research, where it referred to some event or situation that meant a significant turning point or change in the life of a person, an institution or some social phenomenon. He expands this definition by including in it quite commonplace events, which occur in everyday classroom practice. These undramatic and ordinary events reveal factors that have an effect on teachers' thinking and action. At first, these kinds of incidents seem to be usual rather than critical, but they are interpreted as being critical for the purpose of analysis (Tripp, 1993, pp. 24–25). We define critical incidents in much the same way as Tripp, but we emphasise three particular things: (1) the teacher's willingness to examine his or her own practice and develop professionally; (2) the significance of collegial reflection; (3) the time period needed to see and reflect on things from different perspectives and in a wider framework.

Our decision to use critical incidents as a focus of and a tool for reflection is based on the idea that it is neither reasonable nor even possible to reflect on everything that happens in the classroom, and that moreover we have to select what to focus on. When a particular incident is chosen by the teacher and is meaningful to her or him, we assume that even this little incident includes the basic elements of a teacher's personal way of thinking and acting in a pedagogical context. If the same incident is reflected on several times, it is possible to understand its position and meaning in a wider perspective and thus promote professional development.

The procedure of guided reflection

The procedure of guided reflection, which we describe in Figure 1, is developed mainly on a theoretical level. We have used the stimulated recall method in other research projects (see Patrikainen, 2009; Toom, 2006), and the idea of repeated reflective discussions arose on the basis of these experiences.

As Figure 1 shows, the procedure begins with the videotaping of a particular lesson, while the stimulated recall interview (STR) is conducted later. To prevent the teacher from forgetting the details of the lesson the interview should be done within two days. In the STR-interview a teacher discusses the lesson with a colleague or researcher. The goal of the interview is to allow the teacher to bring to mind the actual classroom situation as clearly as possible and to verbalise the thought processes in connection with the actions in the classroom. The teacher describes classroom events and most importantly, gives reasons for the actions taken. In this phase, the most important questions are what, how and why.

In the next phase, reflective discussions that, for the most part, follow the course of the stimulated recall interview are carried out. Here the idea of prolonged reflection is applied and the discussions are conducted after a certain time period, which can vary from weeks to years. The focus of the reflective discussion is the critical incident that the teacher has chosen from among other incidents in the videotaped lesson. The criticality of the incident is defined according to a framework of professional development and is based on the teacher's conscious intentions. Compared with the previous STR-interview, the aim here is to revisit the incident, consider its meanings in a wider context, and explore the possibilities for changing the teacher's actions. Reflective discussions can be repeated several times, on the assumption that they produce a deeper understanding of the teacher's thinking and actions.

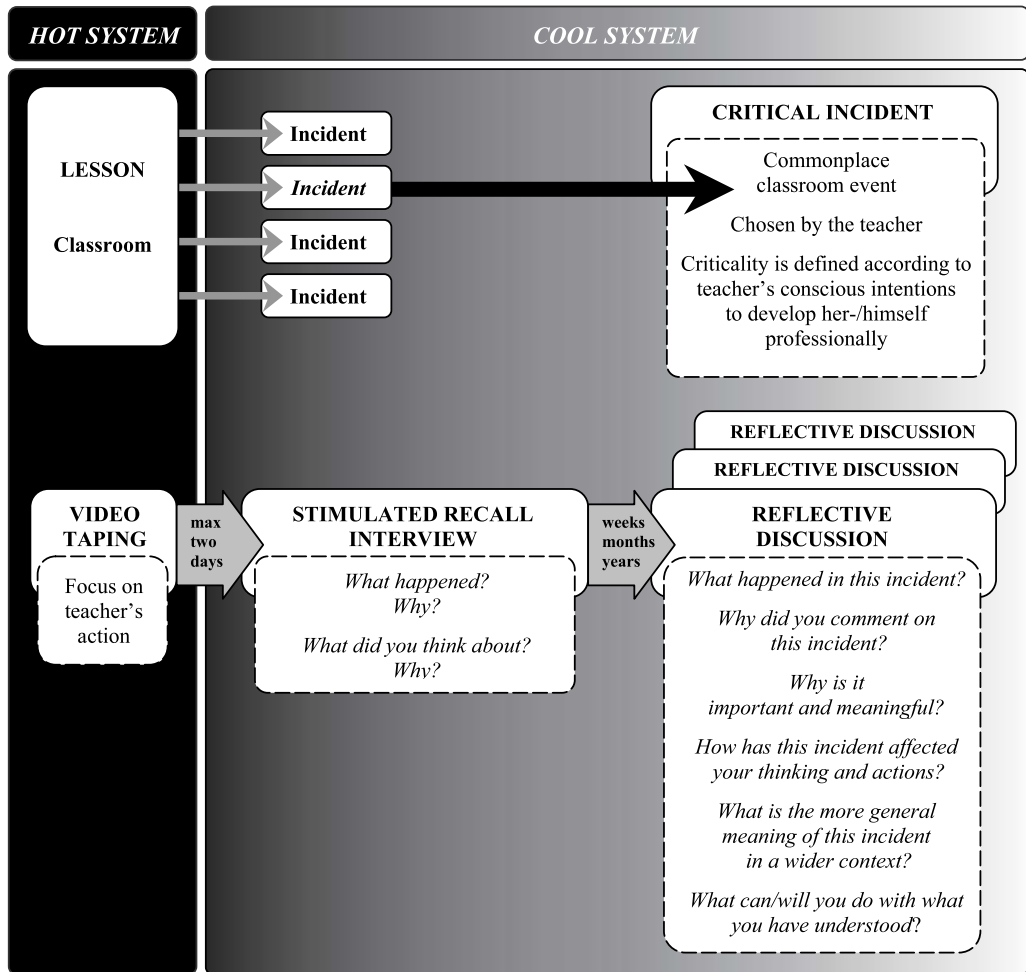


Figure 1. The procedure of guided reflection (Husu, Patrikainen, & Toom, 2007).

The goal of this procedure is to foster teachers' ability to reflect on teaching and thereby on their professional development both attitudinally and functionally. However, as teachers reflect on their work, it is essential to become conscious of the factors that have an effect on their professional development. Tripp (1994, p. 71) reminds us that a teachers' professional practice is not only determined by each individual's values, beliefs, and personal experiences, but also by the social and material conditions of the teacher's professional existence. Consequently, it is possible to improve a teacher's practice, but there are also some areas, the problematic nature of which is known, which cannot be changed.

The use of critical incidents to stimulate teacher reflection is not new, and it has been applied both as a tool for reflection and as a research method. As with the concept of a critical incident, the method is also used in various ways (see Tripp, 1993; Francis, 1997; Griffin, 2003). Our procedure of guided reflection is one way of using critical incidents, and it has its own characteristics. Tripp (1994, p. 72) emphasises the importance of recording the incident, as this enables an examination of the reasons for the practice, and a deeper analysis of them. In contrast to previous research for example by Tripp (1993), Francis (1997) and Griffin (2003), in which incidents are

just written down, our procedure calls for a videotape, an interview, and reflective discussion all used to promote reflection. Tripp (1993, pp. 43–44) mentioned that although he often asked teachers to write down the critical incidents for their own use, he found writing for others to be most rewarding for them. As we have mentioned before, we stress the usefulness and importance of reflection when conducted in interaction with colleagues.

Data collection and analysis

The data of this study were collected from eight student teachers during their final teaching practice period with the procedure of guided reflection. The general goal of the teaching practicum is to achieve competencies in the teaching profession: to acquire an overall impression of a teacher's daily work; to plan, organise and evaluate the whole instructional process; and to analyse this process and the teacher's thinking and action from a theoretical perspective. The practice period is supervised by an expert classroom teacher and a university lecturer, who discuss and give feedback to the student teacher.

The student teachers chose the videotaped lesson themselves, and the stimulated recall interviews were carried out the same or the next day. After the interview student teachers chose an incident according their own intentions for further examination. Reflective discussions were repeated twice. Around a week later, student teachers considered the chosen incident again from different perspectives and in a wider context with the help of the researcher. The second discussion was conducted in the form of a reflective portfolio (Husu, Toom, & Patrikainen, 2008).

In this paper we focus on the preliminary analysis of reflections by four student teachers in stimulated recall interviews and in their initial reflective discussions. The interviews and discussion were transcribed and a coding scheme was developed to analyse forms of reflection in the statements. We used the works of Boud and Walker (1991), Wallace and Louden (2000), Korthagen *et al.* (2001) and Kember *et al.* (1999) as our starting point. These earlier works guided our understanding of teacher reflection and provided conceptual tools to make sense of the data.

The study was a qualitative data analysis using the constant comparison method (Bogdan & Biklen, 1992). It is a process of systematically searching and arranging the accumulated data to increase understanding of it. In the analysis, transcriptions were taken for their capacity to reveal student teachers' pedagogical knowledge and 'to *represent* their thinking' (Freeman, 1996, p. 734, original emphasis). The analysis was first done independently by the two researchers. Both researchers carefully read the transcriptions and interpreted the student teachers' pedagogical reflection expressed in them. The two authors did the initial identification independently, and then agreed upon the reflective meaning units to be coded, thus providing triangulation. After the coding, the researchers checked the reliability of the coding categories by comparing their analyses and in some cases reconciling their analyses. In mutual discussions, some of the reflective statements were moved into a different category. All coding disagreements were discussed in order to reach a common interpretation of the nature of the reflective statements in question.

Results

Forms of reflection in stimulated recall interviews and in reflective discussions

In our analyses, seven forms of reflection could be found in stimulated recall interviews (STR) and reflective discussions (RD), and they are presented in this section. The characterisation of forms of reflection based on our analysis is described and then citations from the authentic data are presented to illustrate the nature of each form of reflection.

(1) *Habituation* contains comments and descriptions of teachers' actions during teaching. This form of reflection involves a nearly automatic performance by the student teachers with little conscious thought and is not necessarily defined as true reflection. Nevertheless, both the stimulated recall (STR) and reflective discussions (RD) data contained several habitual comments, partly because of the presence of the videotape in the interview situations. Student teachers were somewhat embarrassed to see themselves teaching on the videotapes, and they watched with an outsider's perspective. They described both their own and the pupils' actions during the lessons. They also offered some possible reasons for their unexpected actions and finally came to realise how they had managed to cope.

S5: I just noticed how often I fail to complete the ends of sentences when I speak. And it is in all my talk and in my other teaching as well, when I start and open several links in a way. And then they are open there, and I don't remember to close any of them during my teaching. (Student 5; RD 2)

R: OK, exactly. Well then, Student 1 thought about it. Did he ask for any help?

S8: Well, yes, he asked for help when I walked besides their desks, that ...

R: OK.

S8: ... when I watch the video by myself, I'm able to see that he becomes attentive whenever I come close to the tables beside him, so then he can ask.

R: Mmm, yes. (Student 8; RD 4)

(2) *Introspection* involves looking inward and reconsidering one's thoughts and feelings about some teaching issue. The stance emphasises the personal meaning of situations described during STR and RD. Many statements contained biographical connections between personal and professional experiences, when student teachers interpreted their teaching actions during the lessons. In this form of reflection, it was typical for the student teachers to describe their decisions during the lesson quite emotionally. They mentioned positive things like succeeding in teaching, as well as negative things, for example, the possibilities of failing as a teacher. All these reflective statements flavoured their personal tone and also supported their sense of agency.

R: OK. Why do you see it as being important that you make sure at the beginning of the task that

...

S5: That pupils don't start to do them wrongly or feel unsure ... That they ... In my opinion, there they get like ... it's difficult to find the words right now [to explain], that what I mean ... They become sure of those things. I mean that when they start and they know that they're doing it right and ... The fact is that it's nice to encourage them all the time ... (Student 5; STR 9)

S8: And finally, when I counted it myself, [I found that] the answer to the question was wrong in the answer book. The answer was right if you looked at the picture, but the text or the question there was weird ... in relation to the picture there. So, then I finally accepted two answers there, that ... if a pupil had looked at the picture or just trusted only in the text. I counted both those answers, when I noticed the pupils getting different answers.

R: Just right. OK. (Student 8; STR 3)

(3) *Association* means linking prior knowledge, feelings or attitudes with new knowledge and insights. It was typical of this form of reflection that student teachers associated the events on the videotaped lessons with their prior teaching practice experiences, their own experiences as pupils, their experiences as teacher students as well as their prior experiences as substitute teachers or as school assistants. They compared the actual videotaped events with their own similar experiences, but also with totally opposite experiences. This form of reflection was not especially emotional, but it was still strongly connected to student teachers' personal lives. Thus, they expressed their need to re-evaluate their views of teaching in order to modify and accommodate new perspectives in their pedagogical thinking and actions. This form of reflection relates the old and the new and makes way for the new.

- S7: Oh, that was a difficult point there, to separate the ... I really don't know how I should express the things there. So that 'Take those bricks to another box that we will use ...' Because I had to explain it at least seven times. I noticed it also yesterday, that it was somehow, they didn't catch it. They took just one brick of each colour there and didn't understand that they should take all of them, although I tried to explain it.
- R: Yes, it is those very same bricks.
- S7: Yes.
- R: Because they were in the pictures on the paper, they decided to take them to the box too.
- S7: Exactly. (Student 7; STR 1)
- R: Yes, exactly. So, if you think about this instructional process in its entirety and about these instructions here, this unclear situation and then a clearer one, so how does it influence the instructional process?
- S7: Of course, it's more controlled if you give clear advice. It causes some sort of mess more easily – actually it is not possible to cause any big mess in that particular class – but it easily causes disturbance and nervousness in pupils if it is unclear what they should do next. (Student 7; RD 10)

(4) *Integration* involves a reflective stance whereby a student teacher actively seeks to map out the data provided in the teaching experience (and its associations). In STR- and RD-interviews, these reflective statements varied: some statements connected common professional 'know-how in the book' with teaching experiences, while others contained reflective statements that analysed uncertain, unique and often conflicting issues in teaching. The student teachers also expressed this form of reflection by combining the knowledge from their teacher education programmes with their practical experiences. It was typical of this level of reflection that the student teachers used theoretical knowledge from books, from teacher education programmes, from mentors or from supervisors to justify their own viewpoints. All these statements described occasions where student teachers were surprised about what had happened and were moved to rethink their teaching practice.

- R: So then about the things that you wrote on the blackboard. You didn't actually discuss it further, but you concentrated on considering what kinds of instructions you would give a person starting a long trip by car. Why did you take on this kind of task here?
- S6: Well ... We had planned it for this period, and also our supervisor had said that we should include these safety issues in our plan as well. First, some basic facts, then some points concerning ecology and then these safety issues about driving in traffic as well. I solved it in this way. That is how we will now go on.
- R: Right. Yes, OK.
- S6: Yes, although these fuels had nothing to do with them anymore. It was about traffic, but I had included these safety issues as well. (Student 6; STR 1)
- R: Well, OK. If you think about this problem-solving situation or these versatile teaching methods from the pupil's points of view, what is this situation from pupil's perspective? What does it mean for a pupil that you use different methods in your teaching?
- S5: Well, I believe that it really means a lot, because according to my experiences pupils are like ... Some are auditory, some are kinaesthetic, some are aesthetic learners and so it could be varied; there should be something for everyone. Of course, there are those who learn through many different styles, but some pupils learn by doing and some by seeing that ...
- R: OK. So you try to take pupils' styles of learning into account?
- S5: Exactly! (Student 5; RD 2)

(5) *Validation* means testing the old and new ways of thinking and acting in teaching situations. In these reflective statements, student teachers often balanced the pros and cons of their video-taped actions with their prior ways of doing things. Validation required the application of some sort of new learning that was tested in practice. In this form of reflection it was usual that the student teachers described their actions in classroom reality and contrasted them with their preconceptions, prejudices, concerns, fears and doubts about teaching. They also reported, whether their actions turned out to be successful or not. In their reports, student teachers described

at least some elements of the new state of learning, as well as their work through the steps necessary to validate this new state in their thinking and possibly in their actions.

- R: OK. So does this unclear or clear advice have any larger educational effects?
 S7: Mmm ...
 R: If you think that you mainly give unclear instructions, how does it affect the class if you think about it educationally?
 S7: It can cause a mess perhaps. But on the other hand, if a teacher gives a little bit unclear instructions and advice, it will teach a pupil to interpret something there. That ... actually it can be an advantage as well, if everything is not so straightforward and strict, such as 'Sit down and do something, please!', but rather ...
 R: OK, that's quite interesting. I didn't think about it that way.
 S7: Yes, it just suddenly came to my mind. (Student 7; RD 2)
 R: OK. I still ask, because you mentioned that it influences your own teaching, so could you say what that pupil's individual observation means for your own teaching?
 S8: Mmm ...
 R: Does it have something to do with your broader views or teaching principles?
 S8: Well ... well in a way, through individual observation you learn to know your pupils. And somehow you notice the pupils as individuals in your teaching and you can differentiate your teaching. And it makes your planning easier when you know who you are teaching.
 R: Exactly.
 S8: I mean, if you only lecture for masses of pupils, and just let them work individually without observing their work, and wait until they will come to you to check the exercises, then I don't get to know these pupils at all. (Student 8; RD 25)

(6) *Appropriation* in student teachers' statements refers to the process of making the learning one's own and taking it in a personal way. Not all learning is appropriated in this way – only that which student teachers said was a significant influence in their professional knowledge and action. Our data contain reflective statements with equally strong and positive tones. Student teachers described this form of reflection as a kind of personal learning experience, professional understanding and insights. These insights had a strong influence on their actions as teachers and on their professional development at the time. We interpreted them as entering into the student teachers' sense of professional identity and as a significant force in their professional selves.

- R: Yes, exactly. So you said that it will also influence your future as a teacher. What will you do with this knowledge that you have gained from watching your videotaped lesson and discussing these issues?
 S8: Maybe just that, that when I get my own class next autumn, so ... A totally new class and totally new pupils who I don't yet know at all, so ... so somehow I'll use some time there during the beginning of the autumn already; I'll somehow learn to know the pupils as individuals before I start to make exact plans of ways to teach this group.
 R: Mmm. Yes, so you mean that it is like a starting point, a starting point for everything.
 S8: Yes. Because I'll have a new class, so I first have to get to know it somehow, before I can even think about ways to teach the contents that I have planned. And maybe I have to plan some periods as well, but I can't even think about more exact methods before I know the most effective ways of teaching for that class. (Student 8; RD 28)
 R: Yes, OK. So you used some time for this and then you had that last exercise in which you went back to that fuel issue a little bit.
 S6: Yes, I should have taken this last exercise first and just after it, the security issues. But on the other hand, I thought that these foods in this last exercise could relieve the end of the lesson. But maybe I could have changed their order during the lesson. (Student 6; STR 8)

(7) *Transformation* in reflective statements means experiences that are reported to affect the personal and professional foundations of student teachers. Our data contained few statements that predicted readiness in the testing of new manners and methods, change in future teacher behaviour, or commitment to action. Student teachers described this form of reflection on a more

general level and emphasised such things as their personal future challenges. They mentioned problems in their own actions that they needed to focus on and issues in which they needed to develop themselves. Through such reflection, student teachers may confront and even transcend the habits and constraints they otherwise regard as normal and typical for them.

- R: OK. Well, if you think about the future and the fact that you'll work as a teacher next autumn, so how do you think that this reflection affects that time?
- S7: At least I know that I'm not able to think through every single lesson in as detailed a way as I have done up to now. But I think that this is also a thing, that some things will become more automatic after I've performed them a couple of times. But if I think about mathematics or something like that, they won't be automatic and I still have to think about them and plan. But hopefully I don't have to plan beforehand as much as I have done now during this teaching practice. (Student 7; RD 31)
- R: So, you said that this has affected your thinking, and you have thought about observing the pupils more conscientiously. Has it already affected your actions?
- S8: Mm ... this was at the end of my practice period, when I started to reflect on this, so ... Maybe it has already affected me somehow, but maybe even more in the future when I get into classroom with pupils that ... (Student 8; RD 26)

Altogether, our analysis of STR-interviews and RD-interviews from four student teachers produced 142 reflective statements that were analysed according to the seven forms of reflection presented above. Table 2 presents the division of the reflection forms in the analysed data.

The differences between the two phases of reflection

This section presents the features of the reflection interpreted in our data. It also shows the differences between the forms of reflection in stimulated recall interviews and in reflective discussions. The student teachers' reflection during the stimulated recall interviews are understood as *hot* reflection, whereas their reflection during the reflective discussions is labelled as *cool* reflection. In Figure 2, these forms of reflections and the differences between stimulated recall interviews (STR) and reflective discussions (RD) are presented.

As can be seen in Figure 2, quite a large part of reflection in stimulated recall interviews and reflective discussions was interpreted as *habitual reflection* (Form 1). Nearly one third of all reflective statements (29% of the STR-reflection and 31% of the RD-reflection) were interpreted according to this category. It is understandable partly because of the characteristics of data gathering methods, during which the videotaped lesson was watched the entire time. In addition, teachers normally described their habits and ways of behaving during the lessons without any specific justification or argument. They concentrated on describing their ways of being in the classroom. The large number of habitual reflection in STR-interviews and the even larger number

Table 2. The division of forms of reflection in the analysed data.

Form of reflection	Student 5		Student 6		Student 7		Student 8	
	STR	RD	STR	RD	STR	RD	STR	RD
(1) Habituation	33 %	18 %	33 %	37 %	21 %	32 %	25 %	38 %
(2) Introspection	44 %	45 %	22 %	24 %	21 %	29 %	50 %	28 %
(3) Association	6 %	8 %	0 %	7 %	36 %	3 %	25 %	3 %
(4) Integration	0 %	8 %	11 %	2 %	0 %	3 %	0 %	0 %
(5) Validation	17 %	13 %	0 %	17 %	21 %	24 %	0 %	24 %
(6) Appropriation	0 %	8 %	33 %	12 %	0 %	6 %	0 %	3 %
(7) Transformation	0 %	0 %	0 %	0 %	0 %	3 %	0 %	3 %

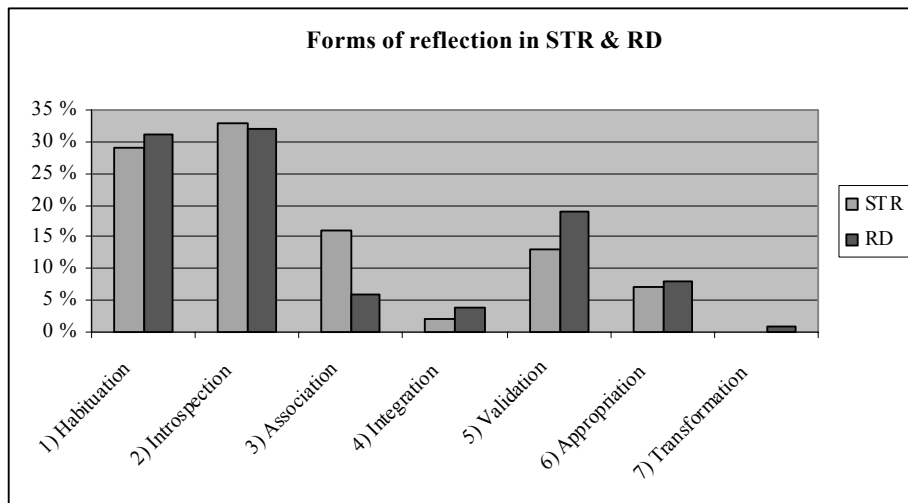


Figure 2. The division of the forms of reflection in the data.

in reflective discussions show that habitual conceptions and thoughts are deeply rooted in teachers' thinking. Teachers readily lean on their habits even in serious professional matters. It is a real challenge for teacher education and research to break this dominance and move the emphasis of teacher thinking towards true reflection.

The greatest part of reflection in the stimulated recall interviews and reflective discussions represented *introspective reflection* (Form 2): 33% of the STR-reflection statements and 32% of the RD-reflection statements were classified in this category. It is quite usual that teachers relate their professional matters to their personal issues. In this category, the focus of reflection was mainly on the teacher's self: how do I feel about this, how does this affect me, or what opinions and beliefs do I have about the issues involving teaching and instruction? This has been shown in other research studies as well, which have reported the difficulties teachers have in extending their reflection beyond self-concerns. The emotional, reflexive, fast, and quite simple *hot* reflection is truly emphasised here.

Transformative reflection (Form 7) and *integrative reflection* (Form 4) were found almost least of all in the data: only 1% of the RD-statements belong to this category. It is challenging to extract more general meanings about one's own everyday teaching or to integrate theoretical knowledge about teaching with practical matters. In STR-interview data, the transformative reflection did not exist at all. But still, in reflective discussions in which the student teachers' reflection was supported by the procedure of guided reflection, the student teachers were able to think about the practical issues of teaching more thoroughly and on a more general level. The integration of theoretical knowledge into practice is a challenge for teacher education and reflection, and it appears in these results as well. Still, the amount of integrative reflection was a little bit bigger during the *cool* reflection phase than during the *hot* reflection. These results encourage thinking about the role, the purpose, and the definition of theory in this context. A big question is how educational theory should actually be understood when the integration of theory and practice is discussed.

The appearance of other forms of reflection, *association* (Form 3) and *appropriation* (Form 6), was approximately the same. A surprising detail here is the significant amount of associative reflection in STR-data during the hot reflection phase: 16% of the STR-statements in our data were interpreted according to this category. By association teachers seek solutions to their

practical problems, and through appropriation they create something meaningful for their practical actions in the future. Interestingly, the amount of *validating reflection* (Form 5) was relatively high, and this was especially emphasised during the cool reflection in the reflective discussion data: 19% of the RD-statements in our data were interpreted according to this category. This might be the most obvious consequence of the procedure of guided reflection that was used in the data collection. Because of the questions presented in the STR-interviews and reflective discussions, the student teachers were ‘forced’ to think about and evaluate their viewpoints from different perspectives. The amount of *cool* reflection, which is cognitive, complex, and sometimes slow in nature, is truly bigger.

The illustration shows that these student teachers’ abilities to reflect on teacher’s professional matters are well developed. From the viewpoint of a teacher’s work, the student teachers’ ability to reflect on this wide scale is very important. In the daily practice of teaching, the habitual, introspective, and associative forms of reflection are clearly necessary. But equally teachers need the ability to integrate theoretical educational knowledge in practice, and even more importantly they need the reflective skills to consider their practical work from more general and future oriented viewpoints and from more abstract stance. In this sense, our analysis provides something to think about. Namely, according to our preliminary results student teachers are capable of reflecting on their teaching in various and multifaceted ways.

Discussion

The student teachers in this study reported professional growth as a result of implementing the procedure of guided reflection in their teaching practicum. As Loughran (2002) has emphasised, challenging the distinction between the theory and the practice of reflection is important, and a conceptualisation of reflective practice is one way to help teacher preparation programmes integrate the two in meaningful ways. According to our preliminary results, broader theoretical perspectives are indispensable to making sense of the teacher reflection data but they are also difficult to attain.

However, from our preliminary analyses, two conclusions emerge. First, contrary to many previous studies (Dinkelman, 2000; Francis, 1995; Harrington, Quinn-Leering, & Hodson, 1996) student teachers are capable of using various kinds of reflection when analysing their teaching practices. This is interesting because there is a widespread belief that student teachers rely solely on self-related concerns in their reflective thinking. Our preliminary results challenge this one-sided belief. Second, we share the common assumption that it is hard for student teachers to move beyond immediate concerns of their teaching practice (habituation) to addressing long-term inquiries in their profession. However, according to our analysis, student teachers question their practices, identify social and cultural constraints or facilitators, and also vision their work into the future. Our findings are still tentative, but we hope they are relevant in developing reflective practices in teacher education.

As has been shown, thoughtful analysis of student teachers’ reflection gave us the opportunity to trace how student teachers construct their pedagogical knowledge. What we have intended to do is to move beyond simply documenting teachers’ ‘mental lives’ to mapping how their reflective capacities and professional knowledge evolve and what influences the development of that knowledge. Also, we intended to investigate more closely what creates changes in teachers’ knowledge and in their reflective processes and how such changes happen. We hope that this opens up new possibilities for studying the development and changes in teachers’ professional learning. It is through the development of pedagogical knowledge and the ability to recognise and respond to such knowledge that student teachers become responsive to the needs, issues, and concerns that are so important in shaping their future practice.

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