

HUOM! Tämä on alkuperäisen artikkelin rinnakkaistalenne. Rinnakkaistalenne saattaa erota alkuperäisestä sivutukseltaan ja painoasultaan.

PLEASE NOTE! This is an Accepted Manuscript of an article published by Taylor & Francis in REFLECTIVE PRACTICE on 6 May 2014, available at <https://doi.org/10.1080/14623943.2014.900028>

Viittaa alkuperäiseen lähteeseen:

Cite the final publication:

Vesterinen, O., Toom, A., & Krokfors, L. (2014). From action to understanding – student teachers' learning and practical reasoning during teaching practice. *Reflective Practice*, 15(5), 618–633. <https://doi.org/10.1080/14623943.2014.900028>

# **From action to understanding - Student teachers' learning and practical reasoning during teaching practice**

This article reports the findings of a study where student teachers' practical reasoning and the development of professional knowledge were investigated during teaching practice in pre-service class teacher education. The model of student teachers' supervision applying the philosophy and principles of the practical argument approach (Fenstermacher & Richardson, 1993; Fenstermacher, 1994) was used in the study and data collection. In this model practical argument premises can be situational, empirical, stipulative or they can be based on value assessments. The videos of student teachers' lessons, stimulated recall interviews and critical incidents were used in order to grasp the situationality and contextuality of the classroom reality. Results show that student teachers mainly expressed situational and empirical premises in their practical argumentation. Stipulative and value premises were also present, but to a lesser degree. During the process, the student teachers developed their arguments from situational and empirical premises towards new value premises and reflections on the stipulative premises guiding their work.

Keywords: teacher education; practical reasoning; teaching practice

Subject classification codes: include these here if the journal requires them

## **Introduction**

“The greatest wisdom is seeing through appearances.”

(Atisha, 11th century Tibetan Buddhist master)

There is a clear expectation that during pre-service teacher education, student teachers learn practices that will enable their construction of practical knowledge and learning (Meijer, de Graaf, & Meirink, 2011; Rodgers, 2002) throughout their teaching career. In research-based teacher education (Toom, Kynäslähti, Krokfors, Jyrhämä, Byman, Stenberg, Maaranen, & Kansanen, 2010; Byman, Krokfors, Toom, Maaranen, Jyrhämä, Kynäslähti, & Kansanen, 2009; Jyrhämä, Kynäslähti, Krokfors, Byman, Maaranen,

Toom, & Kansanen, 2008; Krokfors, 2007; Kansanen, Tirri, Meri, Krokfors, Husu, & Jyrhämä, 2000) students are expected to be reflectively aware of their professional thoughts, actions and even the underpinnings of these processes. A reflective and conscious attitude towards teaching and the teaching profession does not emerge naturally, but instead, student teachers should be guided towards it during their pre-service teacher education.

There exist a small number of studies (e.g. Vermunt & Endedijk, 2011; Korthagen, 2010; Borko, 2004; Endedijk, Vermunt, Brekelmans, & Verloop, 2008) that focus on analysing teacher learning during teacher education. However, previous studies have not focused intensively enough on the learning patterns of student teachers (Grossman, 2007; Cochran-Smith & Zeichner, 2005), and research on the elements related to these patterns is inconsistent (Oosterheert & Vermunt, 2001; Endedijk, Meijer, Vermunt, & Brekelmans, 2009). Student teachers' learning from practice and its relation to the accumulation of their practical knowledge in its various forms have been identified as central elements in their teacher education process (Meijer, de Graaf, & Meirink, 2011). Ottesen (2007) studied reflection in teacher education and presented three modes of reflection during teacher education which are discerned and discussed as (1) reflection as induction to warranted ways of seeing, thinking and acting, (2) reflection as concept development, and (3) reflection as off-line or imagined practices. This is valuable information related to the paradigm of teacher learning.

Accumulative evidence-based knowledge on the elements and processes of student teacher learning during teaching practice in pre-service teacher education is needed in order to develop further the paradigm and study programmes of research-based teacher education. In this article we are interested in the processes involved in and possible development of teacher reasoning and argumentation as elements of teacher

learning. We examined this by addressing two research questions. The first one focuses on the content of teacher knowledge and the second on the processes of thinking.

- (1) What kind of components of practical arguments do student teachers express during their teaching practice?
- (2) What kind of developmental paths emerge in student teachers' practical knowledge during the different phases of their teaching practice?

### **Teacher learning during teacher education**

Teacher learning has been defined from the viewpoints of teachers' individual careers, pupil learning and school development. Previous studies on teacher learning have considered the quality of teacher learning (Darling-Hammond, 2006; Humphrey & Wechsler, 2008; Ing & Loeb, 2008), presented ideal models of teacher learning (e.g. Tynjälä, 2008; Korthagen & Lagerwerf, 2001), defined various patterns of teacher learning in relation to pupil learning (Vermunt & Endedijk, 2011) and aimed at identifying the optimal contexts of teacher learning during a teacher's professional career and development (Bakkenes, Vermunt, & Wubbels, 2010; Watt & Richardson, 2008, Krokfors, 2007). To sum up, teacher learning is seen as a prerequisite for and continuous process of a teacher's professional development.

Research on student's approaches to learning and changes in these approaches in various higher education contexts (e.g. Entwistle & McCune, 2004; Vermunt & Vermetten, 2004; Parpala, 2010) also provides interesting viewpoints when considering student teacher learning and reflection during teacher education. University students with the surface approach to learning aim at remembering and repeating subject matter knowledge in detail and by heart in order to achieve high scores in exams. Strategically

approaching students aim at succeeding in their university studies by focused and organised learning and with strict schedules and regulation of their own learning.

The third approach to learning is what is on the table in this study. A deep approach to learning means that students critically search for relationships between the topics studied, relate them to their prior conceptions and knowledge, aim at understanding the issues being studied in their wholeness and from the viewpoint of their future profession, and search for and reflect on justifications for knowledge, skills or other focuses of learning. This comes very close to Dewey's (1933) idea of reflection as a strict, systematic process of thinking and meaning making related both to theoretical and practical issues, and to Fenstermacher's (1994) idea of teacher's practical argument and reasoning to support their understanding of practice and the connections between theory and practice. Research-based teacher education aims at this kind of deep approach and the goal is to produce inquiry-oriented teachers who learn to make and justify educational decisions based on pedagogical argumentation (Krokkfors, Kynäslähti, Stenberg, Toom, Maaranen, Jyrhämä, Byman, & Kansanen, 2011, Toom et al., 2010; Krokkfors, 2007; Kansanen et al., 2000).

### **Teacher reasoning and practical argument**

When discussing the relationship between theory and practice, it is necessary to consider the philosophical commitments behind it. In a pragmatic way of thinking theory and practice cannot be separated. They are in a transactional process with each other and according to Dewey (1933), action must be taken as the most basic category for philosophical considerations. One of the central ideas of Dewey's pragmatism is that knowing and action are related in a very fundamental way and there is no epistemological difference between them. Actually, Dewey writes that knowing is something that we do. Schön (1983, p. 49) refers to the same idea by saying that our

knowing is ordinarily tacit, implicit in our patterns of action, and that our knowing is in the action (cf. Toom, 2006; 2012). Biesta and Burbules (2003, p. 105) refer to Dewey's action-theoretical framework and argue that "it is not that theory can tell us how things are and that practise merely has to follow". They summarise their view of pragmatism by saying that "if knowledge is indeed a factor in human action, then theory no longer comes before practise, but emerges from and feeds back into practise". Schön's idea of reflecting on action urges us to "stop and think" and helps us to understand the reciprocal relationship between theory and practice in an educational and pedagogical setting.

The notion of practical reasoning originates with Aristotle and contrasts with theoretical reasoning (see Green, 1976). In the case of teachers, it utilizes the idea of considering the practical situations of teaching, its systematic analysis and argumentation. Authentic and problematic practical situations compel teachers to think and decide whether to act, and researchers have variously called these situations pedagogical moments (van Manen, 1991a), dilemmas (Lampert, 2001), or critical incidents (Tripp, 1993). Human life is pervaded by problems, and reasoning is a common response to problems we care about (Audi, 1989). Whereas theoretical reasons might be described as reasons for believing in (and, in some sense, pointing toward) the truth, practical reasons relate to action (Audi, 1989). Audi defines practical reasoning as "an explanatory framework, a rational structure, a unifier of reason and desire, and a central manifestation of rational agency" (Audi, 1989, p. 191). Human beings have the capacity to engage in practical reasoning and to act on the propositions it provides.

Practical arguments are a formal elaboration of practical reasoning. In school, teachers naturally reason in response to their everyday problems and when deciding how to proceed. The structure of a practical argument can be elaborated with

components (i.e., premises) (Fenstermacher & Richardson, 1993). The practical argument approach is based on the Aristotelian practical syllogism and uses the following types of premises, which are also used in the data analysis of this study:

- The situational premise—a statement that describes the context in which the action takes place.
- The empirical premise—a statement subject to empirical scrutiny.
- The stipulative premise—a statement that defines, interprets, or establishes meaning.
- The value premise—a statement of the human benefit, or good, to be derived.

(Fenstermacher & Richardson, 1993, pp. 106–107).

Fenstermacher and Richardson (1993) developed the practical argument approach to change the practice of teachers. Prior research suggests that practical argument analysis increases understanding of the actions a teacher takes in her everyday practice and can therefore enhance pre- and in-service teacher education, and this really makes its use helpful. (Morine-Dersheimer, 1987; Fenstermacher & Richardson, 1993; Morgan, 1993; Vásquez-Levy, 1998). Reflecting on why we did something creates new beliefs and even new knowledge. Teaching practice situations can be seen as “cases,” and teacher argumentation concerning those cases should be regarded as a matter of developing an open forum for a teacher’s professional learning and agency, not only as a matter of defending one’s claims (Meijer et al., 2011).

Criticism of the practical argument approach has been presented too. Munby (1987, p. 362) finds it to be a ‘reconstructed logic’ of the teacher’s thinking. Audi (1989) writes about means-to-end reasoning, which has been ruling in the history of practical argument research (Audi, 1989). According to Pendlebury (1990), arguments

should not be restricted to means-to-end reasoning of the technical kind. The problem might occur if one follows Toulmin's (1958) argument pattern approach in which arguments are seen more as lawsuits. The idea that "logic ... is generalized jurisprudence" and that argumentation is a "case we present in defense of our claims" (Toulmin, 1958, pp. 7–8) is problematic. Teaching is full of "oughts"—such as, "ought to do X"—and one might ask if one's decision is appropriate for a particular purpose given the circumstances involved. In this respect, hypothetical and categorical "oughts" are different (Price, 2008). This highlights the contextuality of reasoning, which supports our claim that teachers' practical arguments should not be seen only as examples of means-to-end reasoning.

Practical argument analysis cannot explain in full why learning and teaching in a classroom happen in the way they do (Morine-Dersheimer, 1987). Still, the analysis of practical arguments is a useful way to investigate teacher learning and pedagogical thinking in the context of teacher education.

### **The Study**

The aim of our study was to investigate student teachers' practical reasoning and the development of practical knowledge during the teaching practice in teacher education. This goal is linked with student teacher learning in practice, on practice, from practice, and even for their future practice.

The model of supervision applying the philosophy and principles of the practical argument approach (Fenstermacher & Richardson, 1993; Fenstermacher, 1994) was used in the study (Figure 1). Originally the model of supervision involved the elicitation and reconstruction of practical arguments in an in-service teacher education context. Here the model was used as part of the pre-service teaching practice supervision procedure. In this model, videos of student teachers' lessons and stimulated recall



interviews, where critical incidents, situationality and contextuality are emphasised were combined (van Manen, 1991b; Lampert, 2001; Tripp, 1993; Price, 2008; Husu, Toom & Patrikainen, 2008).

### ***Participants and context***

Nine primary student teachers participated in the study. Five of the participants were female and four were male from 23 to 40 years of age. All did their teaching practice in the third or the fifth year of their teacher education studies and they all had their first practice period behind them.

The context of this study – teaching practice – is an essential part of the Finnish teacher education, which has certain special features: it is an academic and research-based master-level programme (5 years) for all teacher categories except kindergarten teachers who follow a bachelor-level programme for three years. Finnish teacher education is called research-based for four reasons: 1. Teacher education is considered as higher education, 2. The teaching and learning is based on research, 3. Teacher educators conduct research, and 4. Student teachers learn research skills as well as conduct research projects while integrating theory and practice in their learning (Krokfors et al., 2011; Toom et al., 2010).

Three practising periods are included in a class teacher's pre-service study programme and they take place in the first, third and fifth year. The aim is that the theory practice relationship becomes stronger and it is important that it stretches from the beginning to the end of the studies. Teaching practice accounts for 20 study points out of total of 300. Practising teaching during initial teacher education is an entity and the main practising periods have cumulative and expanding pedagogical focuses of their own. The practising periods and their main goals are as follows.

(1) Orienting practicum (3 study points, in the beginning of the first year) with the themes:

- student perspective
- classroom interaction
- integration of school subjects

(2) Minor subject practicum (9 study points, third year) with the themes:

- the learning process and various learning environments
- pedagogical content knowledge
- planning, organising and evaluating the instructional process

(3) Master's practicum (8 study points, fifth year) with the themes:

- an overall conception of a teacher's daily work
- school and local community
- leadership and organizational aspects of school
- teacher's thinking and action in theory and practice

The theory-practice relationship has evolved in new ways because of the contextualisation of the research-based paradigm and the “teacher as researcher” orientation within it. Practicing teaching is an essential element of student teachers’ learning and personal practical knowledge formation, and its integration with the theoretical core contents is of high importance. The aim is to reflect on one’s practical experiences in order to enhance theoretical understanding and on conceptualisations back again to situated practical understanding. The practice period was supervised by both an expert classroom teacher, who discussed and gave feedback to the student

teachers and by a researcher-supervisor, who used the model of supervision described in Figure 1.

### ***Data***

The data was gathered in the metropolitan area of Helsinki, Finland under the pre-service primary teacher education programme of the University of Helsinki. The researcher-supervisor was the interviewer in the stimulated recall. The interviews were primarily guided by videoed classroom events that were replayed for the student teacher on a computer screen in order to stimulate conversation. In addition, the interviews provided opportunities for the student teacher to take the initiative (when returning to real events or his or her interactive thinking during the lesson) and to take due account of theory (the researcher's theoretical knowledge).

Seeing the video of her/his teaching immediately opened a flow of reflection in the student teachers. According to Fenstermacher (1994), the provision of reasons makes the action seen on the video understandable for both the student teacher and the researcher-supervisor who has observed the actions. The provision of reasons also reveals whether a particular action was a reasonable option, the obvious option or the only option given the circumstances.

[FIGURE 1 HERE – see the end of the PDF]

Figure 1. The model of supervision and the phases of data collection.

Data gathering was conducted in three phases (see Figure 1). First, the lesson that the student teacher(s) conducted was videoed. The researcher took care of the video recording and observed the classroom events and student teacher's actions. Second, the stimulated recall interview method (Bloom, 1953; Calderhead, 1981) was used whereby the video recordings of the lessons were played during the student teachers' first

interviews, which took place the same day the recordings were made. This interview data connects with the first research question about practical argument premises that the student teachers express during their teaching practice. Third, a reflective interview, 1–2 days later (the second dataset), focused on the second research question about the developmental paths that emerged in student teachers' practical knowledge during the different phases of their teaching practice.

The use of video analysis in teacher education and overall teacher quality assessment has become a widely practiced method for documenting, evaluating and changing teachers' practice (Rich & Calandra, 2010). However, the video observation method alone does not necessarily reveal teachers' thinking processes deeply enough. Furthermore, the interview method does not always connect properly with actual events in the classroom. The stimulated recall interview method was utilized because it combines video observation and interviewing to make a better connection between actual events and the student teacher's thinking (for more, see Vesterinen, Toom, & Patrikainen, 2010).

### ***Data analysis***

The data analysis consisted of three phases. The phases were (1) defining the unit of analysis, (2) analysing the structure of practical arguments (1st dataset), and (3) analysing the reflective interview data (2nd dataset) in relation to the earlier analysis with the first dataset. The unit of analysis in the interview data was the student teacher's practical argument in relation to her/his action that had taken place in the classroom or, in the reflective interview (2nd dataset), and reflection on the practical argument presented earlier in the stimulated recall interview.

In the second phase, the structure of student teachers' practical arguments in the stimulated recall data were elaborated in terms of the components, that is, the premises

(Fenstermacher & Richardson, 1993). In this elicitation of practical arguments, the selected episodes were transcribed, and the analysis focused on the structure of the practical reasoning (Audi, 1989). This analysis focused on the practical argument approach, which is based on Aristotelian practical syllogism and the use of premises. As explained above, the situational premise statements describe the context in which the action takes place. The empirical premise statements are subject to empirical scrutiny. The stipulative premises define, interpret or establish meanings, and the value premises are statements related to the human benefit, or good, to be derived.

The third phase of the data analysis involved analyzing the practical arguments through the lenses of developmental paths that emerged. This analysis was based on the earlier premise analysis, which stimulated the further conversation in the supervision process. The developmental paths were analyzed so that the focuses of initial premise analysis, the first dataset, was compared with the second set of data consisting of the reflective interviews (see Figure 1). The main analysis was completed by the first author of this article. The analysis of the practical argument structures (premises) was partly done by the first two authors in order to calibrate the principles of analysis.

## **Results**

### ***Focuses of the practical argument premise in student teachers' reasoning***

What we call the practical argument analysis was behind the first research question about the premise focuses that student teachers expressed during their teaching practice. The student teachers mainly expressed situational and empirical premises in their practical argumentation. Stipulative and value premises also existed, but to a lesser degree. The following data examples illustrate the elicitation of practical arguments that were given by the student teachers in their stimulated recall interviews.

The empirical premises often concerned the pupils' level of understanding of the curricular content and instructions, or the pupils' behaviour. Here, for example (excerpt 1), an empirical premise takes place when a student teacher (Emily) reflects on a student's skills and level of understanding. The reasoning of her own action includes the above mentioned themes. Emily was giving instructions about the use of learning software and a student was not able to follow her instructions.

Excerpt 1:

“When I instructed him to choose ‘File’ from the upper left hand corner [of the screen], and that there we’ll find ‘Save as’, he does not perceive at all, where ‘File’ is. He is clearly a student who also has perception difficulties also in other areas, so this is related to his ability to understand the whole [computer] screen. I told him to look at the upper left hand corner, there is the toolbar and functions... (action).”  
(Emily, empirical premise)

The action which Emily is reflecting on here relates to her instructions and the student's inability to operate accordingly. Emily's practical reasoning focuses on facts she is building about the student's performance and abilities in general. Empirical premise statements are typically subject to empirical scrutiny. Although the student would not have problems with perception diagnosed, it appears in Emily's practical argument as a fact.

A typical situational premise can be identified in Tom's interview (see excerpt 2). The situational premise is a statement that describes the context in which an action takes place. Tom's plans change since the situation demands it. He had to add an example for the students so that there is something they can start from in their assignment.

Excerpt 2:

“In this case I had not planned beforehand that I would give an example (action). When I realised that not all the pupils were able to start working and did not understand how to begin, I decided that I would give one example with some content... But not too much, so that it wouldn't direct their own work too much.”  
(Tom, situational premise)

Giving a practical example (shown on the video projector) to help students in getting started with their concept map task was the action that Tom is reflecting on in his practical argument. For him, the situation looked as if it demanded some extra effort and support from him as otherwise the students would not have been able to get on with their assignment. Still he wanted to leave his example on the video projector minimal so that the students would not just copy his example to their own concept maps.

As mentioned above, situational and empirical premises were mainly expressed in student teachers' practical argumentation. Stipulative and value premises, however, were identified, for example, in Andrea's and Ann's practical arguments. Value premises are statements related to the human benefit, or good, to be derived, whereas stipulative premises define, interpret or establish meanings. First, Andrea's practical argument (excerpt 3) includes a stipulative premise. The action she is reflecting on seemed to the outsider to be something of an exception from the daily classroom routine since she took the initiative in a social interaction with one specific student without any relation to the subject of the lesson.

Excerpt 3:

[Andrea has interacted with one student about his out-of-school interest and in this way has taken this student into account as an individual (action)]. “Somehow I see myself as a teacher the way, that... I do a teacher's work in my own personal way, but I have to leave some, let's say... some possibilities to draw close so that my students feel the pedagogical relationship functioning from their part in the best

possible way. When we construct the pedagogical relationship together, its basic element is a well-functioning mutual interaction.” (Andrea, stipulative premise)

Here Andrea is defining how a pedagogical relationship, something she has studied in her teacher education courses, should be constructed in a well-functioning interaction between herself and her students. ‘Possibilities to draw close’ is her interpretation of keeping the channel open for students to talk to her about anything, no matter if it is not exactly the topic of the lesson.

Second, Ann’s practical argument (excerpt 4) includes a value premise. During her teaching practice, Ann has problematized the classroom interaction, too. She has reminded her class that she is the one who gives students permission to talk. Whether or not students should always raise their hand to get permission to talk was still something she was pondering upon when this event on the video of her lesson was seen where she allowed one student to react freely to the ongoing conversation.

Excerpt 4:

[Ann is reminding the pupils about asking permission to take the floor in the classroom (action)] “It [allowing students to react in the classroom also without asking for permission to talk] does not bother me. I’m not letting it bother me, because otherwise I would be totally neurotic. The assistant teacher in our class is reminding the students more actively – on my behalf. But then again, it is quite important to learn some kind of discussion culture.” (Ann, value premise)

The situation might get out of hand if Ann lets her students react too freely to the ongoing conversation. Or then she might become neurotic, as she says, if she does not allow some reactions by students to be expressed without first receiving her permission. Understanding the practical problems if students are not obliged to ask permission to take the floor, she still thinks that some “human benefit is derived” when students learn about a discussion culture where raising hands is not necessary, either.



A case study by Morine-Dershimer (1987) related to teacher's practical argumentation also implied the frequent appearance of empirical and situational premises with a connection to more infrequent value premises. However, Fenstermacher (1986) has suggested that the improvement of practical arguments in the minds of teachers is crucial. Green (1976) has argued that education in general involves a process of improving the premises in the practical arguments, no matter whose learning is the focus of concern. That way some subjectively reasonable beliefs should become more objectively reasonable. Hence, some developmental paths can, and should, exist even during a single teaching practice period. Next we will focus on the student teachers' improvement in practical argumentation that we were able to detect from our data.

### ***Developmental paths in student teachers' practical knowledge***

The second research question focused on the developmental paths in student teachers' practical knowledge. It was possible to perceive some changes in student teachers' practical knowledge during the supervision process and between the first stimulated recall interview and second reflective interview with them. They widened from situational and empirical premises towards reflections on stipulative and even value premises guiding their practice, although these premises appeared in their reflections to a lesser degree. This reflective "voyage" from the obvious, visible and perceivable elements towards the underlying, invisible and imperceptible factors in teaching follows previous research findings (see Fenstermacher, 1993; Price, 2008).

An example of a developmental path in Ann's practical argumentation was detected when as could be seen on the video of her teaching she changed her original lesson plan (see table 1). Ann reflects upon a decision she made during the lesson. In the elicitation of the first stimulated recall interview she has a situational (There was such a calm mood in the classroom that I didn't want to break that moment) and an

implicit value premise (about the serene atmosphere). In the reconstruction, that is the second, reflective interview she emphasises a whole new point of view with the value premise (It is somehow nice to have this option in a teacher's work). For her it is important that a teacher has the flexibility to make changes to the lesson/daily plan depending on how she feels at that moment.

[TABLE 1 HERE – see the end of the PDF]

Table 1. An example of the developmental path in Ann's practical argumentation.

When changing the premises in practical arguments, a new value premise is one way to improve the practical argument (Green, 1976; Fenstermacher, 1986). In Ann's practical argument, the first implicit value premise is that there should be a fairly serene atmosphere in the classroom. When reconstructing the practical argument related to the same action, she adds a value premise which relates to the autonomy she enjoys in her work when it comes to deciding in which order the daily school subjects are studied with her class.

In another example (see table 2), Andy and Sally are reflecting on the lesson they taught together (which is typical in their third study year's teaching practice). Andy has grabbed the computer mouse from a student to delete something she has added to her concept map and which, in Andy's opinion, does not belong there. In the practical argument both empirical (It was not part of the task) and situational premises (I didn't bogged down arguing about this issue) can be found. In the reconstruction, a whole new way of looking at the action and situation emerge. Actually Andy and Sally become aware of how differently they had understood the goals they were trying to achieve with their teaching.

[TABLE 2 HERE – see the end of the PDF]

Table 2. An example of the developmental path in Andy's and Sally's practical argumentation.

In Andy's original practical argument, the empirical premise about his student adding the wrong kind – from Andy's perspective – of content to her concept map is clear. A situational premise follows when he describes the context where he deleted the content.

In this data example however, not only are the practical arguments in question but the teaching as a whole. In the reflective interview in his supervisor role, the interviewer is illuminating Andy's earlier practical argument, and, indeed, a new value premise (There were two main goals, memorizing and revision) is added by Andy in his reconstruction when he is clarifying the goals he had thought up for the lesson. If the goal was to highlight the importance of students' memorizing and revising the subject content, his action (deleting student's concept map content) might seem reasonable. But the goals for the lesson were now rethought since Andy and Sally could not recognize all the aspects that count in the classroom when a new teaching method is utilized such as working in pairs. This was one of their "voyages" from the obvious, visible and perceivable elements towards the underlying, invisible and imperceptible factors in teaching.

To conclude the results of this analysis, we can address two issues. First, student teachers in pre-service teacher education are usually at the starting point of their careers. It is not easy to reflect on actions taken in teaching practice situations. It is really a challenge for them to understand the details of their teaching actions, extract meanings from them as well as provide arguments for them. Earlier empirical studies have shown the same tendency for practical argument premises to be delimited to empirical and situational premises, as was the case in our study. Second, what is somewhat new here is the evidence we were able to detect from the method of supervision used in pre-

service teaching practice that shows a certain improvement in diversifying the premises to include value and stipulative premises. In our case, the new value premises were not just introduced by the researcher-supervisor but also found to a degree by the student teachers themselves. The reason for this could be the 1–2 day break – which was not used in Fenstermacher and Richardson’s (1993) research – before the reconstruction of the practical arguments. However, it would need further research to get to ascertain the precise reason.

According to the student teachers, the practical argument approach was very fruitful. One of the student teachers, who has been teaching her own class for some years already and is only now completing her teacher degree, mentioned that seeing one’s own actions in the video and reflecting on the situations that had taken place in the classroom was meaningful and important to her.

It was a very meaningful day in my teaching practice as was the opportunity to follow some little pieces of that afterwards. I realised, how different it was watching the videoed lesson [compared to the original in-action situation]. I could concentrate solely on observing the lesson, and I did not have to think about my own teaching, directing the lesson, or having to have quick answers for the students. I felt that it was stimulating to think about the reasons behind the classroom events and what my own influence on it was. And what someone else would have done there. I feel positive about that! (Andrea)

## **Discussion**

Dewey’s notion about the assumption of modern philosophy about the existence of a gap between the sphere of knowing and the sphere of action (Biesta & Burbules, 2003, p. 84) has been the basis for our key questions. When will knowing about our own actions be understood and how could this understanding change one’s future actions?

In this article we reported the findings of a study where student teachers' practical reasoning and the development of professional knowledge were investigated during teaching practice in pre-service teacher education. The findings of our study revealed that the development of student teachers' practical knowledge during teaching practice could be made more systematic and detectable. What is particular to the model we used is that teacher practice supervision is built on a systematic elicitation of the student's mindset and the reconstruction of the practical arguments a day or two later. Instead of just relying on the supervisor's tacit knowledge of the development and supervision process of the student teacher, the model helps to structure the student teachers' process in a descriptive way with less teaching do's and don'ts. Since reflecting on one's own actions does not happen automatically (Grossman, 2007), we need more structured models of supervision.

Student teachers develop their pedagogical thinking each at their own pace, and in many cases, their conceptions of their pedagogy develop before their actions in the classroom. This calls for support to help them put their pedagogical ideas into practice. Hence the challenge is that not all students are able to reach the level of pedagogical thinking required – they rather tend to see their actions in the classroom as stable and unchangeable. The developmental paths discussed in this article demand student teachers' have the ability to present various practical arguments, the ability to reflect on their teaching. With some student teachers, the practical argument premises were short and the developmental paths still difficult to detect.

However, the findings suggest that student teachers can build developmental paths in their pedagogical thinking especially when they are supported in their reflection (cf. Husu, Toom, & Patrikainen, 2008; Voerman et al., 2012). They can bring about more multidimensional views about their own actions in teaching situations. We were

able to see a promotion from visible elements in the teaching situation towards less visible elements such as values and meaning making in student teachers' practical reasoning. In the supervision processes of our study, returning to the events and teaching situations a day or two later clearly helped the student teachers to view the situation and their practical reasoning in a new way.

The presented model of teaching practice supervision has been used on the basis of the idea of research-based teacher education. It represents the pedagogical practices of research-based teacher education authentically and in a detailed way. At the same time, the model acts as an example of how to reflect upon and develop further one's own professional capabilities on entering the teacher's profession and subsequently.

## **References**

- Audi, R. (1989). *Practical reasoning*. London: Routledge.
- Bakkenes, I., Vermunt, J. D., & Wubbels, T. (2010). Teacher learning in the context of educational innovation: learning activities and learning outcomes of experienced teachers. *Learning and Instruction*, 20(6), 533–548.
- Biesta, G. J. J., & Burbules, N. C. (2003). *Pragmatism and educational research*. Lanham: Rowman & Littlefield Publishers.
- Bloom, B. S. (1953). Thought-processes in lectures and discussions. *Journal of General Education*, 7, 160–69.
- Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, 33(8), 3-15.
- Butcher, J. & McDonald, L. (Eds.), (2007). *Making a difference: Challenges for teachers, teaching and teacher education*. Rotterdam: Sense Publishers.
- Byman, R., Krokfors, L., Toom, A., Maaranen, K., Jyrhämä, R., Kynäslähti, H., & Kansanen, P. (2009). Educating Inquiry-Oriented Teachers: Students' Attitudes and Experiences towards Research-Based Teacher Education. *Educational Research and Evaluation*, 15(1), 79–92.
- Calderhead, J. (1981). Stimulated recall: A method for research on teaching. *British Journal of Educational Psychology*, 51, 211–17.

- Cochran-Smith, M., & Zeichner, K. M. (Eds.). (2005). *Studying teacher education: The report of the AERA panel on research and teacher education*. American Educational Research Association. Mahwah, NJ: Lawrence Erlbaum Associates.
- Darling-Hammond, L. (2006). *Powerful Teacher Education*. San Francisco: Jossey-Bass.
- Darling-Hammond, L. (Ed.), (1994). *Review of research in education*. Washington, DC: American Educational Research Association.
- Dewey, J. (1933). *How we think*. Buffalo, NY: Prometheus Books.
- Endedijk, M. D., Meijer, P. C. Vermunt, J. D., & Brekelmans, J. M. (2009). The development of student teachers' quality of self-regulated learning in a dual learning programme. Paper presented at the 13th Conference of the European Association for Research on Learning and Instruction, Amsterdam, Netherlands, August 25–29.
- Endedijk, M. D., Vermunt, J. D., Brekelmans, M., & Verloop, N. (2008). The quality of student teachers' self-regulated learning in innovative learning programs. Paper presented at the AERA 2008, New York.
- Entwistle, N. & McCune, V. (2004). The conceptual bases of study strategy inventories. *Educational Psychology Review*, 16(4), 325–345.
- Fenstermacher, G. D. (1986). Philosophy of research on teaching: Three aspects. In M. C. Wittrock (Ed.), *Handbook of research on teaching*, 3rd ed. (pp. 37–49). New York: Macmillan.
- Fenstermacher, G. D. (1994). The knower and the known: The nature of knowledge in research on teaching. In L. Darling-Hammond (Ed.), *Review of research in education* (pp. 3–56). Washington, DC: American Educational Research Association.
- Fenstermacher, G. D., & Richardson, V. (1993). The elicitation and reconstruction of practical arguments in teaching. *Journal of Curriculum Studies*, 25(2), 101–14. <http://dx.doi.org/10.1080/0022027930250201>
- Green, T. F. (1976). Teacher competence as practical rationality. *Educational Theory*, 26(3), 249–58. <http://dx.doi.org/10.1111/j.1741-5446.1976.tb00732.x>
- Grossman, P. (2007). Unpacking practice: developing a language for teacher educators. In J. Butcher & L. McDonald (Eds.), *Making a difference: Challenges for teachers, teaching and teacher education* (pp. 55–65). Rotterdam: Sense Publishers.

- Grossman, P., & Loeb, S. (Eds.), (2008). *Alternative Routes to Teaching. Mapping the New Landscape of Teacher Education*. Cambridge: Harvard Education Press.
- Humphrey, D. C., & Wechsler, M. E. (2008). Getting Beyond the Label: What Characterizes Alternative Certification Programs? In P. Grossman, & S. Loeb (Eds.), *Alternative Routes to Teaching: Mapping the New Landscape of Teacher Education* (pp. 65–97). Cambridge: Harvard Education Press.
- Husu, J., Toom, A. & Patrikainen, S. (2008). Guided reflection as a means to demonstrate and develop student teachers' reflective competencies. *Reflective Practice*, 9(1), 37–51.
- Ing, M., & Loeb, S. (2008). Assessing the Effectiveness of Teachers from Different Pathways: Issues and Results. In P. Grossman, & S. Loeb (Eds.), *Alternative Routes to Teaching. Mapping the New Landscape of Teacher Education* (pp. 157–186). Cambridge: Harvard Education Press.
- Jakku-Sihvonen, R., & Niemi, H. (Eds.). (2007). *Education as Societal Contributor: Reflections by Finnish Educationalist*. Frankfurt am Main: Peter Lang.
- Jyrhämä, R., Kynäslähti, H., Krokfors, L., Byman, R., Maaranen, K., Toom, A., & Kansanen, P. (2008) The Appreciation and Realization of Research-Based Teacher Education: Finnish students' experiences of teacher education. *European Journal of Teacher Education*, 31(1), 1–16.
- Kansanen, P., Tirri, K., Meri, M., Krokfors, L., Husu, J., & Jyrhämä, R. (2000). *Teachers' Pedagogical Thinking. Theoretical Landscapes, Practical Challenges*. New York: Peter Lang Publishing.
- Korthagen, F. A. J. (2010). Situated learning theory and the pedagogy of teacher education: Towards an integrative view of teacher behavior and teacher learning. *Teaching and Teacher Education*, 26, 98–106.
- Korthagen, F. A. J., Kessels, J., Koster, B., Lagerwerf, B. & Wubbels, T. (Eds.), (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. Mahwah: Lawrence Erlbaum Associates.
- Korthagen, F. A. J., & Lagerwerf, B. (2001). Teachers' professional learning: how does it work? In F. A. J. Korthagen, J. Kessels, B. Koster, B. Lagerwerf, & T. Wubbels (Eds.), *Linking practice and theory: The pedagogy of realistic teacher education* (pp. 175–206). Mahwah: Lawrence Erlbaum Associates.
- Krokfors, L. (2007). Two fold role of pedagogical practice in research-based teacher education. In R. Jakku-Sihvonen, & H. Niemi. (Eds.), *Education as Societal*

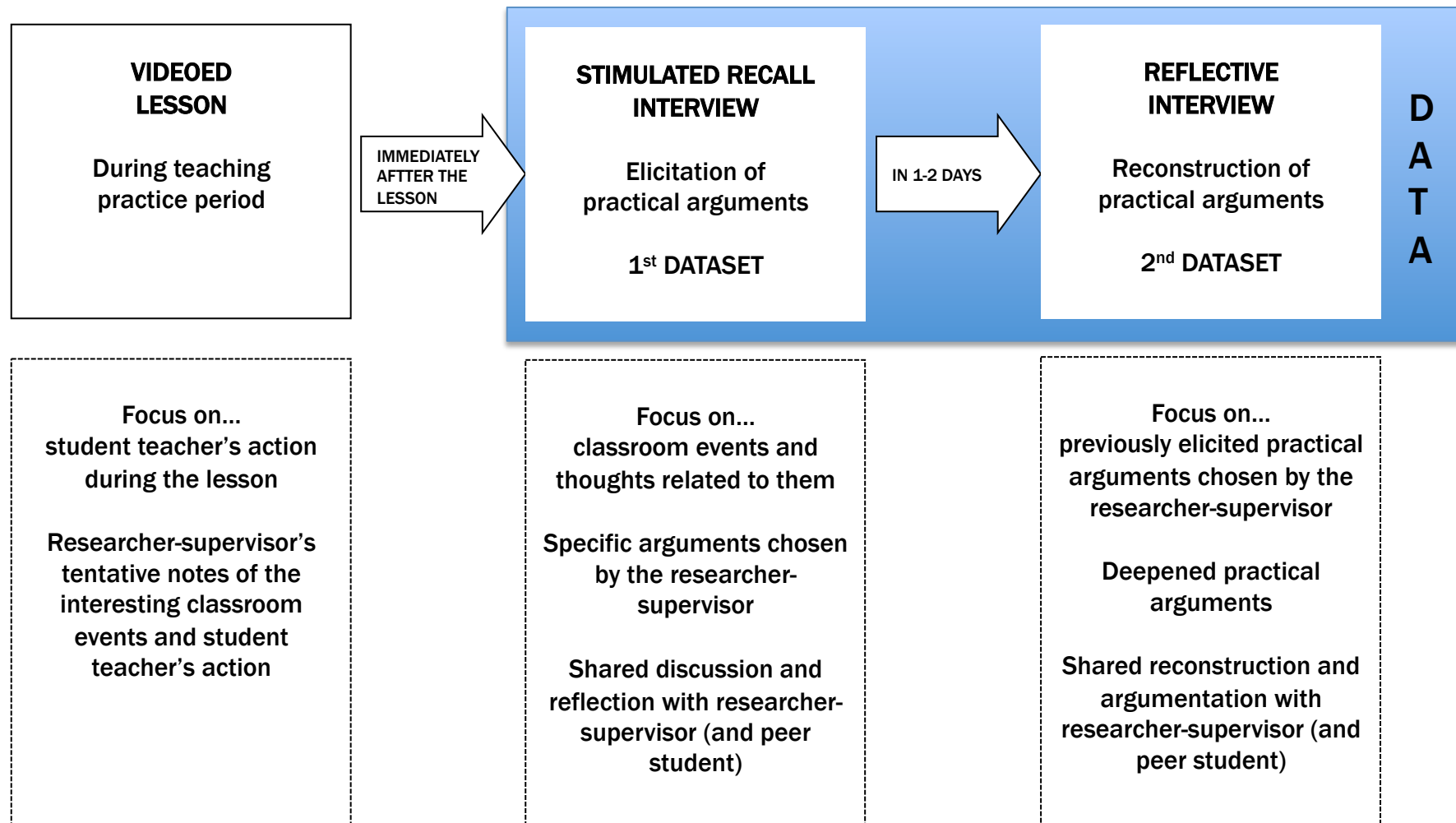


- Contributor: Reflections by Finnish Educationalist (pp. 147–160). Frankfurt am Main: Peter Lang.
- Krokfors, L., Kynäslahti, H., Stenberg, K., Toom, A., Maaranen, K., Jyrhämä, R., Byman, R., & Kansanen, P. (2011). Investigating Finnish teacher educators' views of research based teacher education. *Teaching Education*, 22(1), 1–13.
- Lampert, M. (2001). *Teaching problems and the problems of teaching*. New Haven, CT: Yale University Press.
- Meijer, P. C., de Graaf, G., & Meirink, J. A. (2011). Key experiences in student teachers' development. *Teachers and Teaching: Theory and Practice*, 17(1), 115–129.
- Morgan, B. (1993). Practical rationality: A self-investigation. *Journal of Curriculum Studies*, 25(2), 115–124. <http://dx.doi.org/10.1080/0022027930250202>
- Morine-Dersheimer, G. (1987). Practical examples of practical arguments: A case study. *Educational Theory*, 37(4), 395–407.
- Munby, H. (1987). Practical arguments and scientific knowledge in the thinking of teachers. *Educational Theory*, 37(4), 361–368.
- Oosterheert, I. E., & Vermunt, J. D. (2001). Individual differences in learning to teach: Relating cognition, regulation and affect. *Learning and Instruction*, 11(2), 133–56.
- Ottesen, E. (2007). Reflection in teacher education. *Reflective Practice: International and Multidisciplinary Perspectives*, 8(1), 31–46.
- Parpala, A. (2010). Exploring the experiences and conceptions of good teaching in higher education: Development of a questionnaire for assessing students' approaches to learning and experiences of the teaching-learning environment. Doctoral dissertation. University of Helsinki: Institute of Behavioural Sciences.
- Pendlebury, S. (1990). Practical arguments and situational appreciation in teaching. *Educational Theory*, 40(2), 171–179.
- Price, A. W. (2008). *Contextuality in practical reason*. New York: Oxford University Press.
- Rich, P., & Calandra, B. (2010). Video, video everywhere: Issues and evidence of video analysis in teacher education. Introduction to special issue. *Educational Technology*, 50(1), 3.
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842–866.

- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think In Action*. London, Temple Smith.
- Toom, A. (2006). Tacit pedagogical knowing: At the core of teacher's professionalism. Research reports 276. University of Helsinki: Department of Applied Sciences of Education.
- Toom, A., Kynäslahti, H., Krokfors, L., Jyrhämä, R., Byman, R., Stenberg, K., Maaranen, K., & Kansanen, P. (2010). Experiences of research-based approach to teacher education: Suggestions for future policies. *European Journal of Education*, 45(2), 331–344.
- Toom, A. (2012). Considering the artistry and epistemology of tacit knowledge and knowing. *Educational Theory*, 62(06), 621-640.
- Toulmin, S. (1958). *The uses of argument*. Cambridge, UK: Cambridge University Press.
- Tripp, D. (1993). *Critical incidents in teaching: Developing professional judgement*. London: Routledge.
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review*, 3, 130–154.
- van Manen, M. (1991a). Reflectivity and the pedagogical moment: The normativity of pedagogical thinking and acting. *Journal of Curriculum Studies* 23(6), 507–536. <http://dx.doi.org/10.1080/0022027910230602>
- van Manen, M. (1991b). *The tact of teaching: The meaning of pedagogical thoughtfulness*. Ontario: Althouse Press.
- Vásquez-Levy, D. (1998). Features of practical argument engagement. *Teaching and Teacher Education*, 14(5), 535–550. [http://dx.doi.org/10.1016/S0742-051X\(98\)00004-3](http://dx.doi.org/10.1016/S0742-051X(98)00004-3)
- Vermunt, J. D., & Endedijk, M. D. (2011). Patterns in teacher learning in different phases of the professional career. *Learning and Individual Differences*, 21, 294–302.
- Vermunt, J. D., & Vermetten, Y. J. (2004). Patterns in student learning: Relationships between learning strategies, conceptions of learning, and learning orientations. *Educational Psychology Review*, 16(4), 359–384.
- Vesterinen, O., Toom, A., & Patrikainen, S. (2010). The stimulated recall method and ICTs in research on the reasoning of teachers. *International Journal of Research and Method in Education*, 33(2), 183–197.

- Voerman, L., Meijer, P. C., Korthagen, F. A. J., & Simons, R. J. (2012). Types and frequencies of feedback interventions in classroom interaction in secondary education. *Teaching and Teacher Education*, 28(8), 1107–1115.
- Watt, H. M. G., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction*, 18, 408–428.
- Wittrock, M. C. (Ed.), (1986). *Handbook of research on teaching*, 3rd ed. New York: Macmillan.

# FIGURE 1



<i>Action</i>	<i>Practical argument elicitation (1st dataset)</i>	<i>Reconstruction (2nd dataset)</i>
<p>Ann is modifying her plans and materials in a situation to meet the requirements of the moment. She is not introducing an activating exercise for students because the class is so calm at the moment. She continues with the approach which suits her best.</p>	<p>A: I was pondering if I should use the sit down [i.e. 'No']—stand up [i.e. 'Yes'] method of answering my questions, so that the students would get some physical exercise too. But then I noticed that there was such a calm mood in the classroom that I didn't want to break that moment (Situational premise). Sometimes I take a more physical play or a song in the middle of the lesson if the students seem stale. But now it was all so serene (Implicit value premise).</p>	<p>The interviewer has shared the analysis of the practical argument premises, which included a situational premise and an implicit value premise. A: It [the decisions I make during the lesson] is sometimes influenced by how I feel. I may even switch the daily schedule a bit. If I don't feel like having Mother tongue with all that [activating] play, I might switch to Maths [for that lesson]. It is somehow nice to have this option in a teacher's work (Value premise).</p>



<i>Action</i>	<i>Practical argument elicitation (1st dataset)</i>	<i>Reconstruction (2nd dataset)</i>
<p>Andy: "You have put that there... it does not belong here".</p> <p>He takes the mouse from a student and deletes an object from her concept map.</p> <p>A: "You can continue your work now."</p>	<p>Interviewer: What do you think, what is the effect when you take it [the mouse] from her?</p> <p>A: Likely not a positive one. What could have been the effect, mm? Quite unmotivating, because this [the task] wasn't that informal for students.</p> <p>Sally: It was still formal.</p> <p>A: Exactly. And actually it [the content that the student had added] was not part of the task (Empirical premise).</p> <p>I: You don't have to see it so negatively. What was good in your action?</p> <p>A: That I didn't bogged down arguing about this issue. It [the concept map content] was only taken away and we focused on the task (Situational premise).</p>	<p>(After opening the practical argument premises to Andy and Sally, the interviewer asks a question)</p> <p>I: Does this depend totally on the goals of the lesson? If the aim of the lesson is that they memorize a lot of things, and it is significant that they express that in their work somehow, then it was a really logical action. If we think that there were various functions, working in pairs for example, then it wasn't that reasonable a thing to do.</p> <p>A: There were two main goals, memorizing and revision, meaning the subject content, and then the learning software (Value premise).</p> <p>S: I disagree about the aims of the lesson, I didn't think that learning to use the software was so important. I think it was more important to learn to work in pairs than to use the software.</p> <p>A: I thought that we were doing such basic things with the software, some windows and menus, that was such basic stuff [that should have been easy to learn].</p> <p>S: I watched from the video that maybe we guided students on somewhat different areas. I was with that pair about 70% of the lesson, and afterwards I realized that the problem was that they were not able to work together.</p> <p>A: So this shows that none of the goals will be fulfilled, if the basic things are not in order.</p>

