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# Student-Teachers' And School-Based Teacher Educators' Beliefs About Teaching Practices And Instructional Goals

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## Abstract

Beliefs about teaching are integrated into teaching practices and instructional goals that impact teachers' professional development. The aim of the research was to identify the beliefs that student-teachers and school-based teacher educators have about the development of pupils' cognitive and social competences. First-year student-teachers and school-based teacher educators completed a questionnaire. The results revealed that the teachers' beliefs vary according to their teaching experience. The student teachers preferred practices that were aimed at mechanical acquisition. The teacher educators' choices of teaching practices were aimed at developing the pupils' learning competences and the implementation of competence-based tasks. To support the student-teacher's professional development and formation of their beliefs, it is important to implement different combinations of teaching practices.

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*Keywords:* effective teaching; teachers' beliefs; school-based teacher educator; student-teacher

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## 1. Introduction

Effective teaching in the classroom is correlated to pupils' academic achievements and study results (Seidel & Shavelson, 2007; Stronge, Ward, & Grant, 2011), as well as teachers' beliefs about teaching practices (Korthagen & Vasalos, 2005). A teacher's belief as an indicator of their professional development can be defined as a form of personal knowledge about the pupils, the learning process and the material that is being taught (Kagan, 1992). How beliefs as a complex system of self-efficacy, pedagogical knowledge and culture influence the teacher's teaching

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practices in the classroom has been examined quite profoundly (Guskey, 2002; Meijer, Korthagen, & Vasalos, 2009; Schaaf, Stokking, & Verloop, 2008). Teachers' beliefs have a strong influence on their inclination to implement new teaching practices (Pajares, 1992; Tatto & Coupland, 2003). In order to guide effective teaching (on the teacher – pupil or school-based teacher educator – student-teacher level), it is important, together with the pedagogical practice of school-based teacher educators and student-teachers, to study the beliefs about teaching. The aim of the present research was to analyse the school-based teacher educators' and student-teachers' beliefs about the choice of teaching practices aimed at the pupils' cognitive and social development.

### *1.1. The role of beliefs in the teacher's professional development*

Experience changes the teacher's beliefs in different stages of their professional development (Lampert, 1997; Torff, 2005). There can be two-way changes: teachers start using new teaching practices, e.g., focus on discussions or pupils' individual needs, or turn back to old ways, e.g., giving precise instructions and minimising the part of individual work (Bakkens, Vermunt, & Wubbels, 2010). Research has focused on student-teachers' beliefs about teaching (Thomson, Turner, & Nietfeld, 2012; Wilke & Losh, 2008) with the aim of perfecting teacher training programmes (File & Gullo, 2002; 2010; Tarman, 2012). Students beginning a teacher training programme usually rely on beliefs about teachers and teaching that they have from their own school experience (Lortie, 1975; Thomson et al., 2012). Students without any experience of teaching practice do not connect the teachers' activities to the reality of the classroom (Leijen, Kullasepp, & Ots, 2013). 'Unreal optimism' based on the acquired knowledge is characteristic of a student-teacher beginning their teaching practice at school (Pajares, 1992). When students underestimate the complexity of teaching and perceive the difference between their teaching and established teaching standards, they develop 'a reality shock' (Veenman, 1984). Tarman's (2012) analysis shows that practical experience in the classroom may change beliefs about teaching. For example, a negative personal experience or the impression of a school-based teacher educator's teaching style may adversely affect students' beliefs. A noticeable change in the students' beliefs already took place after the first teaching experience (Ng, Nicholas, & Williams, 2010). According to Thomson et al. (2012), student-teachers at the beginning of their teacher training course form two groups; one group does not have a clear idea of effective teaching, whereas the other has beliefs that clearly include purposeful effective teaching and consideration for the pupils' needs. Studies of practising teachers have mostly focused on self-efficacy and professional development (Bandura, 1977; Woolfolk & Hoy, 1990) or a connection between different beliefs (Driel, Bulte, & Verloop, 2007; Fives & Buehl, 2008). The teachers' beliefs influence their readiness to change their teaching practices (Tarman, 2012). Bakkens et al. (2010) assume that changing beliefs is a long-lasting process. There are not so many comparative studies of student-teachers and practising teachers (He & Levin, 2008; Rozelle & Wilson, 2012). Good performances by the pupils are essential to all teachers, but there are differences in the preference of teaching practices, which has been explained by differences in teaching experience. Research has found that although students attach importance to following the structures of lesson plans and certain teaching models, practising teachers adapt the structure according to the pupils' needs (He & Levin, 2008). Teachers of little experience seem to have belief in the effectiveness of tasks that require critical thinking and analytical skills (e.g., solving problems independently), whereas more experienced teachers take into consideration the students' cognitive abilities and use less the kind of activities that develop the pupils' critical thinking and require solving problems (Torff, 2005).

### *1.2. Connection between teachers' beliefs and teaching practices*

Relying on their beliefs, teachers use different teaching practices to guide the pupils' cognitive and social development (Ferguson, 2002; Woolfolk Hoy et al., 2006). Teaching practices are activities used by the teacher in the teaching process to develop the pupils' competences (OECD, 2009). A causal link has been found between the teachers' beliefs and their teaching practices (Anders & Richardson, 1991), which in the case of student-teachers is expressed by their ability to define their teaching practices more clearly (Tillema, 2000). Nevertheless, it is not clear whether the teachers' beliefs are in correlation with their teaching practices in the classroom, i.e. what they do and what they believe to be doing may differ (Devine, Fahie, & McGillicuddy, 2013).

Several studies based on the cognitive learning theories indicate that teachers, through their choice of teaching practices, are influenced by the level of the pupils' cognitive development (Buff et al., 2011; Mayer, 2004; Seidel & Shavelson, 2007). With easier tasks the teachers involve pupils more and encourage their independence, whereas

with more difficult tasks they compile accurate instructions and see that they are followed (Blay & Ireson, 2009). The aim of guiding the pupils' cognitive development generates a need for retention and transfer. Training retention is important as doing different tasks demands prior knowledge and a large part of teaching is about linking previous knowledge with new knowledge (Krathwohl, 2002). Researchers have shown that whereas student-teachers concentrate on teaching the subject, experienced teachers focus on the pupils' cognitive development (Okas, van der Schaaf, & Krull, 2013). Studies on the beliefs of teaching practices show that teachers highly appreciate the individual approach and discussion (Opdenakker & van Damme, 2006), while a large proportion of teachers prefer to revise the material and check if the pupils have acquired it; they do not take pupils as partners (OECD, 2009). In addition to the pupils' cognitive development, their social development is also important (Perry, Donohue, & Weinstein, 2007). Teachers should cope with controversies between their beliefs and the changing social norms that have an impact on their classroom practices. Interaction and teamwork have a fundamental role in human cognitive and social development (Vygotsky, 1978). In socio-cultural teaching practice the principle of sharing experience is essential: the smarter partner (teacher, fellow student) helps with problem solving (Blake & Pope, 2008). Bearing in mind the pupils' social development, research has revealed the importance of promoting cooperation skills (Zwaans, van der Veen, Wolman, & ten Dam, 2008) and has found that cooperation-oriented tasks develop the pupils' social competences that have an effect on their cognitive development and learning skills (Hattie & Gan, 2011).

### *1.3. Teaching practices in Estonian context*

The question of effective teaching in Estonia is significant in the context of the international comparative researches PISA and TIMSS (OECD, 2013; TIMSS, 2011). The teachers' and student-teachers' beliefs and choices of teaching practices are influenced on the one hand by the social changes in the society during the last decades, and, on the other hand, by the effects of totalitarian ideology that many teachers still suffer from (Uibu, Kikas, & Tropp, 2011). There are more senior teachers with long-term teaching experience among Estonian teachers and fewer younger teachers with short-term teaching experience than in TALIS research countries on average (Loogma, Ruus, Talts, & Poom-Valickis, 2009). Senior teachers may have problems with using innovative teaching practices (Tuul, Ugaste, & Mikser, 2011). Estonian teachers are capable of organising classroom activities and maintaining discipline, although orientation towards passive acquisition of knowledge can create problems (Loogma et al., 2009; OECD, 2009). According to PISA tests (OECD, 2013), although the pupils' knowledge has improved over the years, the direction and scope of the change in teaching practices and their influence on the pupils' achievement is not clear. There are changes in the student-teachers' beliefs about teaching practices: the teacher's role is to support the pupil in their learning process; subject-related knowledge is insufficient for effective teaching; and both teaching and learning are influenced by social factors (Löfström & Poom-Valickis, 2013; Timoštšuk & Ugaste, 2010).

### *1.4. Aims and hypotheses*

The aim of the current research was to examine student-teachers' and school-based teacher educators' beliefs about effective teaching practices and their enhancement of the pupils' cognitive and social development. Although the research of beliefs has a long history (Guskey, 2002; Richardson, 2003), it is only partially clear to what extent student-teachers' beliefs differ from teachers' beliefs (He & Levin, 2008). The study had five set goals.

1. To compare student-teachers' and school-based teacher educators' preferences for the domains of pupils' cognitive and social development. Student-teachers value the development of the pupils' social skills, whereas practising teachers value the pupils' cognitive development (Devine et al., 2013). We assumed that the preference for cognitive domains is higher for school-based teacher educators than for student-teachers.
2. To analyse student-teachers' and school-based teacher educators' beliefs about the use of teaching practices in order to achieve different instructional goals. Some studies have shown that student-teachers' beliefs about teaching are somewhat idealistic (Pajares, 1992; Thomson et al. 2012), so students may find different teaching practices suitable for the pupils' social and cognitive development. We assumed that student-teachers' goals are more diverse.
3. To find out the differences between student-teachers' and school-based teacher educators' beliefs about cooperative and individual teaching practices. In line with earlier studies (Devine et al., 2013; He & Levin,

2008), we supposed that in comparison with school-based teacher educators, the student-teachers prefer more individual teaching practices in order to achieve pupils' cognitive as well as social development.

4. To analyse to what extent student-teachers differ from school-based teacher educators in their beliefs about specific teaching practices in aiming to develop pupils' social and cognitive enhancement. The frequency of the usage of different teaching practices in pursuing the study goals correlates to teaching experience (Torff, 2005). We assumed that the frequency of use of different teaching practices is different for student-teachers and school-based teacher educators.
5. To investigate groups of teachers with different profiles of beliefs and their pupils' cognitive development. It has been found that beliefs are connected with the teacher's individuality as well as teaching experience (Murphy et al., 2004). We expected to find groups of teachers who to a lesser or greater extent prefer domains of cognitive and social development.

## 2. Method

### 2.1. Sample

The data, comprised 187 teachers (85.2% female, 13.2% male) of whom 95 (50.3%) were first-year undergraduate student-teachers and 92 (48.7%) were school-based teacher educators. Some teachers did not specify their age, education level and gender. The student-teachers completed the questionnaire before starting the teacher-training at the university. The student-teachers were selected from different teacher-training faculties and had never taken any teacher-education courses. The student-teachers' average age was 21.81 years, SD = 6.58 and 12.8% had previous teaching experience in schools. The school-based teacher educators (further: teacher educators) completed the questionnaire during teacher training sessions at the university. The teachers were employed across the spectrum of school types (e.g., state, municipal and private schools) and provided education to the students at a variety of school stages (e.g., basic school, gymnasium). The teachers' average age was 41.38 years, SD = 12.20, and they had an average teaching experience of 17.17 years, SD = 10.20.

### 2.2. Measure and procedure

The questionnaire, covering teachers' beliefs about effective teaching practices and instructional goals, was designed according to the theories and practices of earlier studies (Krathwohl, 2002; Mayer, 2002; Uibu & Kikas, 2012; Uibu et al., 2011). The suitability of items was discussed in a group of teacher educators and in-service teachers. The questionnaire was piloted before the study. The first part of the questionnaire comprised 10 sentences, describing different teaching practices (e.g., to assign students to acquire facts and rules) aimed at pupils' cognitive development. The cognitive development covered three domains: *Mechanical acquisition*, *Implementation*, and *Generalisation* (see Table 1). The teachers were provided with a list of 10 instructional purposes (e.g., to promote remembering) and asked to check 'yes' or 'no' to using each practice for each goal. The second part of the questionnaire measured teachers' beliefs about seven teaching practices (e.g., to do group work with pupils), aimed at pupils' social development (e.g., to support pupils' initiative). The social development goals comprised three domains: *Independence*, *Reflexive skills*, and *Social competence* (Table 1). The instructions for both parts of the questionnaire were the same. All items began with the phrase 'In the teaching process I consider to be effective...'. The completion of the questionnaires took approximately 20 minutes. The students' questionnaires were administered by the first author and fellow researchers of the study, the teachers' questionnaires were administered by the project managers. The respondents' answers were coded separately for each teaching practice and instructional goal according to whether they were chosen (1) or not chosen (0). The number of teaching practices used for each instructional goal was counted. Then we scored how many cognitive and social goals were chosen for each teaching practice. The practices were divided into two groups: *Individual teaching practices* and *Cooperative teaching practices*, enhancing both pupils' cognitive and social development. The internal consistencies of the teaching practices (Cronbach's alpha) ranged from .62 to .85 (Table 1).

### 2.3. Data analysis

Both variable- and person-oriented approaches to the data analysis were employed (Bergman, Magnusson, & El-Khouri, 2003; Cohen, Manion, & Morrison, 2007). First, the variable level analyses were carried out with SPSS Statistics, version 20.0. One-way ANOVA was used to analyse the differences between students' and teachers' beliefs of various instructional goals and teaching practices. The two-sample (discriminant) Configural Frequency Analysis (CFA, Version 2000 by von Eye) was conducted to find out differences in the distribution of student-teachers' and teacher educators' beliefs of effective teaching practices and instructional goals. If two samples are compared, significant differences in the representation of the members of groups indicate the discrimination type (Bergman et al., 2003; von Eye, 2000). To interpret the results, the scores of the teachers' representation were standardised and categorised into three levels. If the standardised score was above and equal to 0.5, the result was considered high; a Z score less than and equal to  $-0.5$  was considered low; a Z score between 0.5 and  $-0.5$  was categorised as average.

### 3. Results

To examine student-teachers' and teacher educators' preferences for the aforementioned domains of pupils' cognitive and social development as well as specific instructional goals, descriptive statistics were calculated for the whole sample and for two teachers' groups (Table 1).

Table 1. Descriptive statistics of development domains and instructional goals.

Domains and goals	Whole sample (N = 187)		$\alpha$	Student-teachers (N = 95)		Teacher educators (N = 92)	
	M	SD		M	SD	M	SD
I Cognitive development	max = 10			max = 10			
1 Mechanical acquisition			.79**				
Remembering	2.43	1.86	.84*	2.80	1.81	2.04	1.83
Determining correct answers	2.60	2.35	.89*	3.35	2.47	1.84	1.94
Recalling	3.37	2.58	.84*	3.94	2.71	2.79	2.32
2 Implementation			.77**				
Thinking	6.52	2.15	.76*	6.86	2.10	6.20	2.16
Application	5.44	2.36	.78*	5.45	2.47	5.43	2.25
Comprehension	5.67	2.70	.86*	6.05	2.58	5.27	2.78
3 Generalisation			.85**				
Linking knowledge	5.58	2.35	.79*	5.84	2.18	5.30	2.49
Generalising knowledge	4.05	2.25	.75*	4.23	2.34	3.86	2.16
Analyzing	6.08	2.15	.74*	6.24	2.12	5.91	2.18
Problem solving	5.36	2.18	.74*	5.31	2.21	5.42	2.16
II Social development	max = 8			max = 8			
1 Independence			.79**				
Independence	2.54	1.54	.68*	2.43	1.40	2.63	1.66
Initiative	3.10	1.76	.66*	3.13	1.72	3.07	1.81
Opinion	2.98	1.61	.68*	3.13	1.61	2.84	1.60
2 Reflexive skills			.73**				
Effective learning	3.77	1.86	.78*	4.15	1.73	3.38	1.93
Individuality	3.3	1.75	.77*	3.27	1.70	3.38	1.80
Learning skills	3.58	1.91	.77*	3.15	1.94	4.03	1.78
3 Social competence			.66**				
Social skills	3.89	1.29	.75*	3.84	1.21	3.95	1.38
Behavioural habits	2.94	1.53	.75*	2.83	1.56	3.04	1.50

Note: \* =  $\alpha$  for instructional goal was calculated with tetrachoric correlations with each practices as chosen or not chosen;

\*\* =  $\alpha$  for cognitive and social development was calculated with Pearson correlations with all respective goals of the scale.

To analyse differences between student-teachers' and teacher educators' preferences for the domains of pupils' Cognitive and Social development, the 2 (teacher group) x 3 (development domain) one-way ANOVAs were implemented. According to the results, the student-teachers scored higher than teacher educators for Mechanical acquisition,  $F(1,185) = 18.39, p < .001, \eta^2 = .090$ . For the domains of students' Social development, no difference was found between the two groups of teachers. Then we examined student-teachers' and teacher educators' beliefs about using various teaching practices in order to achieve particular instructional goals. Student-teachers' choice of several instructional goals was more varied in comparison to teacher educators' ones. In particular, the student-teachers selected more teaching practices for Cognitive development goals: Determining correct answers,  $F(1,185) = 21.53, p < .001, \eta^2 = .104$ ; Recalling,  $F(1,185) = 9.59, p = .002, \eta^2 = .049$ ; Remembering,  $F(1,185) = 8.07, p = .005, \eta^2 = .042$ ; Thinking,  $F(1,185) = 4.59, p = .034, \eta^2 = .024$ ; and Comprehension,  $F(1,185) = 3.97, p = .048, \eta^2 = .021$ .

Continuing the previous analyses, differences were found between teachers' beliefs of teaching practices in aiming at Social development goals. Teacher educators evaluated more effective than student-teachers the use of different teaching practices for enhancing pupils' Learning skills,  $F(1,185) = 10.61, p = .001, \eta^2 = .054$ . Vice versa, student-teachers selected more practices for Effective learning,  $F(1,185) = 8.23, p = .005, \eta^2 = .043$ . Next, we determined the differences between student-teachers' and teacher educators' beliefs about Cooperative and Individual teaching practices in relation to students' Cognitive and Social development. Descriptive statistics of the groups of teaching practices are presented in Table 2.

Table 2. Teaching practices for students' social and cognitive development.

Teaching practice	Student-teachers (N = 95)		Teacher educators (N = 92)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>I Cognitive development</b>				
<b>1 Individual teaching practices</b>				
Acquire facts and rules	4.52	2.50	3.09	2.63
Drill and practice	5.69	2.44	4.92	2.56
Do practical work	5.46	2.23	5.51	2.43
Solve problems independently	5.17	2.13	4.26	2.28
Link knowledge to other subjects	5.27	2.34	4.74	2.33
Find different ways of solving problems	4.41	2.10	4.36	2.28
Solve complicated tasks	4.19	2.08	4.00	2.20
<b>2 Cooperative teaching practices</b>				
Solve tasks with students	4.72	2.20	4.67	2.34
Analyse with students the process of solution of tasks	4.84	2.33	4.05	2.11
Initiate discussions in class	5.80	2.17	4.47	2.35
<b>II Social development</b>				
<b>1 Individual teaching practices</b>				
Appreciate good behaviour	3.64	1.91	3.74	1.98
Do much independent work	3.76	1.78	3.15	1.92
Solve ability-appropriate tasks	2.95	1.58	3.63	1.79
<b>2 Cooperative teaching practices</b>				
Arrange rules with students	3.92	2.35	4.37	2.06
Support communication with peers	3.69	1.85	3.78	1.80
Ask topic-related questions to each other	3.85	1.93	3.66	1.72
Organise group work	4.12	1.83	3.98	1.86

We found that student-teachers preferred more than teacher educators Individual teaching practices for students' Social development,  $F(1,185) = 7.05, p = .009, \eta^2 = .037$ , as well as Cognitive development,  $F(1,185) = 4.98, p = .027, \eta^2 = .026$ . However, no difference was found between the teachers' groups for preference of Cooperative teaching practices. Next, we supposed that the frequency of choosing teaching practices that aim at pupils' Social and Cognitive enhancement differentiated between teachers. Actually, we found that student-teachers selected teaching practices for promoting pupils' Cognitive development more frequently. Significant differences were found for Initiate discussions in class,  $F(1,185) = 16.26, p < .001, \eta^2 = .081$ , Acquire facts and rules,  $F(1,185) = 14.43, p < .001, \eta^2 = .072$ , Solve problems independently,  $F(1,185) = 7.94, p = .005, \eta^2 = .041$ , Analyse with students the



process of solution of tasks,  $F(1,185) = 5.86$ ,  $p = .016$ ,  $\eta^2 = .031$ , as well as Drill and practice,  $F(1,185) = 4.44$ ,  $p = .036$ ,  $\eta^2 = .023$ . In addition, student-teachers used more Do much independent work,  $F(1,185) = 5.03$ ,  $p = .026$ ,  $\eta^2 = .026$ , when compared with teacher educators. However, teacher educators preferred more teaching practices for Solve ability-appropriate tasks,  $F(1,185) = 7.64$ ,  $p = .006$ ,  $\eta^2 = .040$ . Further, the two-sample discriminant CFA with standard  $\chi^2$  test for 2 (teacher group) x 3 (development domain) was implemented to find out combinations more typical of student-teachers, in comparison to the school-based teacher educators' beliefs of different domains of students' Cognitive and Social development separately. Significant differences were revealed in the distribution of two groups of teachers between their beliefs of domain of Social development. First, more teacher educators than teacher students scored at the average level of the enhancement of students' Social development,  $\chi^2 = 10.74$ ,  $p = .001$ . Second, more student-teachers than teacher educators scored Social development at the high level,  $\chi^2 = 7.89$ ,  $p = .005$ . However, we could not reveal any typical or atypical beliefs of the domains of Cognitive development for two teachers' groups.

#### 4. Discussion

The aim of the research was to find out student-teachers' and school-based teacher educators' beliefs about effective teaching practices and their usage in developing the pupils' cognitive and social skills. Compared to their instructors, student-teachers preferred the kinds of tasks that were aimed at mechanical acquisition of knowledge, and in addition to revision and retention they considered the development of thinking, comprehension and effective learning important. They were more likely to choose individual teaching practices to develop the pupils' cognitive and social skills, whereas the teachers' choice of teaching practices was more likely to be aimed at developing the pupils' learning competences and they considered it important to give them ability-appropriate tasks in order to achieve different instructional goals. In addition, two groups of teachers targeted the development of their pupils' social competence at different levels. First, we analysed student-teachers' and teacher educators' preferences for the domains of students' cognitive and social development. We discovered that student-teachers valued the pupils' mechanical acquisition more. This result differs from the hypothesis, but is in line with a previous study carried out in Estonia (Okas et al., 2013) which revealed that student-teachers focus more on subject-related knowledge and retention. According to He and Levin (2008) the reason for preferring mechanical acquisition could be that student-teachers rely on their previous experience from their own school experience, if at the time the core emphasis was on rote learning and reciting, then, as a teacher, they tend to value the same practices. Another reason could be the students' inadequate knowledge of teaching objectives in educating pupils (Ng et al., 2010). However, there were no differences in the student-teachers' and teacher educators' preferences for the domains of pupils' social development. Zwaans et al. (2008) also refer to the development of social skills being of secondary importance in the teaching process and emphasise the need to support teachers in setting and achieving their goals. Secondly, we assessed the teachers' beliefs about using teaching practices in pursuing different goals. We discovered that the student-teachers preferred practices suitable for achieving different goals. They differed from their instructors by focusing more on revision, retention and acquisition. In addition, they preferred practices to develop the students' way of thinking and comprehending. This is in line with Wilke and Losh (2008) who conclude that students consider different teaching practices effective for different objectives at the beginning of their teacher training, as they do not have a very clear idea of effective teaching practices (Thomson et al., 2012). Compared to practicing teachers, the student-teachers also prefer practices ensuring effective learning. Murphy et al. (2004) believe that active teaching methods are important for students because they should guarantee effective learning. In our research teacher educators, more than student-teachers, prefer teaching practices with the aim of moulding the pupils' learning skills. Blay and Ireson (2009) also note in a comparative study that teacher educators, more than student-teachers, stress the importance of focusing on the pupils' learning process and developing their learning competences. According to Stronge et al. (2011) successful teachers use focused instruction for that aim. Next, we assessed the differences between the beliefs of student-teachers and teacher educators about cooperative and individual teaching practices. Contrary to our expectations, the differences between the two groups of teachers appeared not in cooperative but individual teaching practices. In the context of both cognitive and social development of the pupils, student-teachers preferred individual teaching practices more than teacher educators. The reason why students use more individual learning could be the lack of confidence of students and teachers with little teaching experience in the choice of teaching practices (He & Levin, 2008). As for cooperative teaching practices there were no significant differences between the two groups. The lack of interest in cooperative teaching practices among Estonian teachers has also been noted



in earlier studies (Loogma et al., 2009; Uibu et al., 2011). When asked how many goals the student-teachers and school-based teacher educators considered feasible to be fulfilled using different teaching practices, it emerged that the student-teachers' choice was wider than that of the teachers. Statistical differences occurred in practices such as acquiring facts and rules, drill and practice, and solving problems independently. A preference for reproductive teaching practices refers to the teachers' need to be in control of the teaching process (Opdenakker & van Damme, 2006). It is clear that if a teacher with little teaching experience does not have the skill of controlling the learning process (Okas et al., 2013) and cannot make decisions about teaching practices and their suitability for particular social and cognitive development, they tend to use reproductive practices as these enable them to be in control. Our research also gives reason to assume that student-teachers may feel unsafe for the fear of losing control of the class (Ng et al., 2010). On the positive side, student-teachers, more often than teacher educators, preferred the kind of teaching practices that aim at developing higher levels of thinking skills. Significant differences occurred in the preferences of 'Initiate discussions in class' and 'Analyse with students the process of solution' kinds of tasks. Using analysis and discussion in the learning process is essential in order to develop communication skills in addition to thinking and making conclusions. It is believed that these skills are of crucial importance in supporting the pupils' cognitive processes and besides, discussions stimulate pupils to be active in the learning process (Opdenakker & van Damme, 2006). In the social sphere there was a difference between student-teachers and practicing teachers in consideration to using independent work. Previous research has also noted a negative correlation between the proportion of independent work and growing expertise (Bakkens et al., 2010). Another difference was that teacher educators considered it more important than student-teachers to give the pupils ability-appropriate tasks. In the context of the choice of teaching practices, Torff (2005) argues that experienced teachers take the pupils' abilities into account more, are more flexible and can find suitable teaching practices faster. Partially in line with our expectations, the Configural Frequency Analysis revealed distributions between the beliefs of the two groups of teachers. We expected to find teachers' profiles with higher and lower preferences for both students' cognitive as well as social development domains. We first found that more teacher educators than student-teachers preferred to develop students' social competences at an average level. Second, more student-teachers than teacher educators enhanced students' social competences at a high level. To promote students' different social competences it is important that teachers critically appreciate their instructional goals in the implementation of teaching practices (Blake & Pope, 2008). Student-teachers' beliefs about pupils' development may be more progressive, therefore they scored higher in the domain of pupils' social competence (Löfström & Poom-Valickis, 2013). However, no typical or atypical distribution was revealed for the domains of students' cognitive development. Our research had some limitations. Firstly, we did not analyse the connection between the teachers' beliefs about teaching practices and their level of education and the subject that they teach. It would also be important to study beliefs together with other characteristics such as age and length of experience. Secondly, in addition to questionnaires, other forms of data collection could be used (semi-structured interviews). As Pajares (1992) says, there can be notable differences between the beliefs and practices of teachers of little experience. Thirdly, as the sample of our research was university-based, we cannot apply the results to the whole of the Estonian teacher training programme. Despite these limitations, the value of the research lies in the fact that it gives an idea of the differences between student-teachers and school-based teacher educators, as well as for their beliefs about teaching practices. In order to support the student-teachers' professional development and formation of their beliefs and teaching practices, it is important to use a combination of practices as a model in teacher training courses.

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### References

- Anders, P. L., & Richardson, V. (1991). Research directions: Staff development that empowers teachers' reflections and enhances instruction. *Language Arts*, 68, 316–320.
- Bakkenes, I., Vermunt, J. D., & Wubbels, T. (2010). Teacher learning in context of educational innovation: Learning activities and learning outcomes of experienced teachers. *Learning and Instruction*, 20, 533–548.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.

- Bergman, L. R., Magnusson, D., & El Khouri, B. M. (2003). *Studying individual development in an interindividual context*. London: Lawrence Erlbaum Associates
- Blake, B., & Pope, T. (2008). Developmental psychology: In incorporating Piaget's and Vygotsky's theories in classrooms. *Journal of Cross-Disciplinary Perspectives in Education*, 1(1), 59–67.
- Blay, J. A., & Ireson, J. (2009). Pedagogical beliefs, activity choice and structure, and adult-child interaction in nursery classrooms. *Teaching and Teacher Education*, 25, 1105–1116.
- Buff, A., Reusser, K., Rakoczy, K., & Pauli, C. (2011). Activating positive affective experiences in the classroom: "Nice to have" or something more? *Learning and Instruction*, 21(3), 452–466.
- Cohen, L., Manion, L., & Morrison K. (2007). *Research methods in education*. 6<sup>th</sup> ed London: Routledge.
- Devine, D., Fahie, D., & McGillicuddy, D. (2013). What is 'good' teaching? Teacher beliefs and practices about their teaching. *Irish Educational Studies*, 32(1), 83–108.
- Ferguson, C. (2002). Using the revised taxonomy to plan and deliver team-taught, integrated, thematic units. *Theory into Practice*, 41(4), 238–243.
- File, N., & Gullo, D. F. (2002). A comparison of early childhood and elementary education students' beliefs about primary classroom teaching practices. *Early Childhood Research Quarterly*, 17, 126–137.
- Fives, H., & Buehl, M. (2008). What do teachers believe? Developing a framework for examining beliefs about teachers' knowledge and ability. *Contemporary Educational Psychology*, 33, 134–176.
- Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice*, 8(3/4), 381–391.
- Hattie, J., & Gan, M. (2011). Instruction based on feedback. In R. Mayer & P. Alexander (Eds.), *Handbook of research on learning and instruction* (pp. 249–271). New York: Routledge.
- He, Y., & Levin, B. B. (2008). Match or mismatch? How congruent are the beliefs of teacher candidates, cooperating teachers, and university-based teacher educators? *Teacher Education Quarterly*, Fall, 37–55.
- Kagan, D. M. (1992). Implications of research on teacher belief. *Educational Psychologist*, 27(1), 65–90.
- Korthagen, F., & Vasalos, A. (2005). Levels in reflection: core reflection as a means to enhance professional growth. *Teachers and teaching: theory and practice*, 11(1), 47–71.
- Krathwhol, D. R. (2002). Revising Bloom's taxonomy. *Theory into Practice*, 41(4), 212–218.
- Lampert, M. (1997). Teaching about thinking and thinking about teaching. In V. Richardson (Ed.), *Constructivist Teacher Education: building new understanding* (pp. 84–107). London: The Falmer Press.
- Leijen, A., Kullasepp, K., & Ots, A. (2013). Õpetaja professionaalse rolli internaliseerimise hindamine õpetajakoolituse esmaõppe üliõpilaste hulgas [Investigating the internalization of professional role expectations among pre-service teachers]. *Eesti Haridusteaduste Ajakiri*, 1, 72–96. doi: <http://dx.doi.org/10.12697/eha.2013.1.05>.
- Löfström, E., & Poom-Valickis, K. (2013). Beliefs about teaching: persistent or malleable? A longitudinal study of prospective student teachers' beliefs. *Teaching and Teacher Education*, 35, 104–113.
- Loogma, K., Ruus, V-R., Talts, V., & Poom-Valickis, K. (2009). Õpetaja professionaalsus ning tõhusama õpetamis- ja õppimiskeskonna loomine. OECD rahvusvahelise õpetamise ja õppimise uuringu TALIS tulemused. Tallinn: Tallinna Ülikooli haridusuuringute keskus.
- Lortie, D. (1975). *School teacher*. Chicago: University of Chicago Press.
- Mayer, R.E. (2004). Should there be a three-strikes rule against pure discovery learning? *The case for guided methods of instruction American Psychologist*, 59(1), 14–19.
- Meijer, P. C., Korthagen, F. A. J., & Vasalos, A. (2009). Supporting presence in teacher education: The connection between the personal and professional aspects of teaching. *Teaching and Teacher Education*, 25, 297–308.
- Murphy, K. P., Delli L. A. M., & Maeghan, N. (2004). The good teacher and good teaching: Comparing beliefs of second-grade students, preservice teachers, and inservice teachers. *The Journal of Experimental Education*, 72(2), 69–92.
- Ng, W., Nicholas, H., & Williams, A. (2010). School experience influences on pre-service teachers' evolving beliefs about effective teaching. *Teaching and Teacher Education*, 26(2), 278–289.
- OECD (2009). Creating effective teaching and learning environments: First results from TALIS, OECD, Paris. Retrieved from <http://www.oecd.org/education/school/43023606.pdf>.
- OECD (2013). PISA 2012 Results: Ready to Learn – Students' Engagement, Drive and Self-Beliefs (Volume III). doi: <http://dx.doi.org/10.1787/9789264201170-en>
- Okas, A., van der Schaaf, M., & Krull, E. (2013). Algajate ja kogunud õpetajate praktilise teadmise avaldamine tunnisündmuste kommenteerimisel stimuleeritud meenutuse meetodil [Teachers' Practical Knowledge in Novice and Experienced Teachers' Comments on Classroom Interactions]. *Eesti Haridusteaduste Ajakiri*, 1, 25–45. doi: <http://dx.doi.org/10.12697/eha.2013.1.03>
- Opendakker, M-C., & van Damme, J. (2006). Teacher characteristics and teaching styles as effectiveness enhancing factors of classroom practice. *Teaching and Teacher Education*, 22, 1–21.
- Pajares, F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, 62(3), 307–332.
- Perry, K. E., Donohue, K. M., & Weinstein, R. S. (2007). Teaching practices and the promotion of achievement and adjustment in first grade. *Journal of School Psychology*, 45, 269–292.
- Richardson, V. (2003). Pre-service teachers' beliefs. In J. Raths & A. C. McAninch (Eds.), *Teacher beliefs and classroom performance: The impact of teacher education* (pp. 1–22). Greenwich, Connecticut: Information Age Publishing.
- Rozelle, J. J., & Wilson, S. M. (2012). Opening the black box of field experiences: How cooperating teachers' beliefs and practices shape students teachers beliefs and practices *Teaching and Teacher Education*, 28, 1196–1205.
- Schaaf van der, M. F., Stokking K. M., & Verloop N. (2008). Teacher beliefs and teacher behaviour in portfolio assessment. *Teaching and Teacher Education*, 24, 1692–1704.
- Seidel, T., & Shavelson, R. (2007). Teaching effectiveness research in the past decade: the role of theory and research design in disentangling meta-analysis results. *Review of Educational Research*, 77(4), 454–499.
- Stronge, J. H., Thomas T. J., & Grant, L. W. (2011). What makes good teachers good? A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of Teacher Education*, 62(4), 339–355.

- Tarman, B. (2012). Prospective teachers' beliefs and perceptions about teaching as a profession. *Educational Sciences: Theory and Practice*, 12(3), 1964–1973.
- Tatto, M. T., & Coupland, D. B. (2003). Teacher education and teachers' beliefs. In J. Raths & A.C. McAninch (Eds.), *Teacher beliefs and classroom performance: The impact of teacher education* (pp.123–181). Greenwich, Connecticut: Information Age Publishing.
- Thomson, M. M., Turner, J. E., & Nietfeld, J. E. (2012). A typological approach to investigate the teaching career decision: Motivations and beliefs about teaching of prospective teacher candidates. *Teaching and Teacher Education*, 28, 324–335.
- Tillemma, H. H. (2000). Belief change towards self-directed learning in student-teachers: Immersion on practice or reflection on action. *Teaching and Teacher Education*, 16, 575–591.
- Timoštuk, I., & Ugaste, A. (2010). Student teachers' professional identity. *Teaching and Teacher Education*, 26, 1563–1570.
- TIMSS (2011). *Trends in International Mathematics and Science Study*. Retrieved from <http://nces.ed.gov/timss/>
- Torff, B. (2005). Developmental changes in teachers' beliefs about critical-thinking activities. *Journal of Educational Psychology*, 97(1), 13–22.
- Tuul, M., Ugaste, A., & Mikser, R. (2011). Teachers' perceptions of the curricula of the Soviet and post-Soviet eras: A case study of Estonian pre-school teachers. *Journal of Curriculum Studies*, 43(6), 759–781.
- Uibu, K., & Kikas, E. (2012). Authoritative and authoritarian-inconsistent teachers' preferences for teaching methods and instructional goals. *Education*, 3(13), 1–18.
- Uibu, K., Kikas, E., & Tropp, K. (2011). Instructional approaches: differences between kindergarten and primary school teachers. *Compare: A Journal of Comparative and International Education*, 41(1), 91–111.
- Van Driel, J. H., Bulte, A. M. W., & Verloop, N. (2007). The relationships between teachers' general beliefs about teaching and learning and their domain specific curricular beliefs. *Learning and Instruction*, 17, 156–171.
- Veenman, S. (1984). Perceived problems of beginning teacher. *Review of Educational Research*, 54, 143–178.
- Von Eye, A. (2000). *Introduction to Configural Frequency Analysis. The search for types and antitypes in cross-classifications*. Cambridge, UK: Cambridge University Press.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wilke, R. A., & Losh, S. C. (2008). Beyond belief: Preservice teachers' planned instructional strategies. *Action in Teacher Education*, 30(3), 64–73.
- Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology*, 82, 81–91.
- Woolfolk-Hoy, A., Davis, H., & Pape, S. J. (2006). Teacher knowledge and beliefs. In A. P. Alexander, P. Winne, & N. J. Mahwah (Eds.), *Handbook of educational psychology* (pp. 715–732). London: Lawrence Erlbaum Associates.
- Zwaans, A., van der Veen, I., Wolman, M., & ten Dam, G. (2008). Social competence as an educational goal: the role of the ethnic composition and the urban environment of the school. *Teaching and Teacher Education*, 24, 2118–2131.