

Exploring the essential characteristics of research-based teacher education from the viewpoint of teacher educators

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ABSTRACT This paper presents a study, which aims to gain greater understanding of the characteristics of research-based approach from the viewpoint of teacher educators. The study examines 1) How much do the teacher educators appreciate the research-based approach in teacher education? 2) How do the teacher educators define and understand the research-based approach in teacher education? and 3) How do the teacher educators understand the connections between the research-based approach in teacher education and teacher's everyday work? The study presented here is a part of the wide research project, in which the research-based teacher education is investigated from various different viewpoints. The mixed method approach was used in gathering both qualitative and quantitative data. The analysis of quantitative data showed teacher educators' positive attitudes towards research based approach. The qualitative content analysis of teacher educators' interviews revealed four specific characteristics, by which it is possible to understand the research-based teacher education more deeply. They defined it as context (academic teacher education); as approach (main organising theme of teacher education); as content (curriculum of teacher education), and as aim (teacher's pedagogical thinking).

Keywords: research-based teacher education, academic teacher education, levels of teacher education, twofold practice in teacher education, teacher educators

INTRODUCTION

Research-based teacher education has lately received increasing interest both among researchers of teacher education (e.g. Kansanen et al., 2000; Jakku-Sihvonen & Niemi, 2006, 2007) and in public discussion. However, it is still not clear how researchers and discussants understand the expression 'research-based' or the concept of research-based teacher education. In following pages we make efforts to clarify diverse interpretations of the attribute 'research-based'. We will also present one way to look at research-based teacher education on a theoretical level.

One aspect of 'research-based' may be associated with another attribute, 'evidence-based'. The roots of the latter can be detected to medicine where two types of evidence-based medicine have been suggested: evidence-based guidelines and evidence-based individual decision making (Eddy, 2005). Similarly, we can discuss two types of research-based teacher education. Through research on teacher education we gain results, evidence, which can be used as guidelines for further development of teacher education. Another type concerns the everyday practice of an individual teacher, so called teacher's pedagogical thinking.

Second aspect where the concept 'research-based' is used is research-based teaching. University teaching is based on a teacher's expertise which has been reached through research work. Third aspect of 'research-based', in this article, is research-based teacher education as

an approach or main organising theme of teacher education programmes. A central aim within this kind of programmes is to educate inquiry-oriented future teachers.

The results we present in this article are a part of a wider research project in which research-based teacher education is investigated. The focus of the previous research activities has been the students of a special multimode program and the students of the ordinary class teacher education programme (Kynäslähti, Kansanen, Jyrhämä, Krokfors, Maaranen, & Toom, 2006; Jyrhämä, Kynäslähti, Krokfors, Byman, Maaranen, Toom, & Kansanen, 2008, in press).

TOWARDS A THEORETICAL FRAMEWORK OF RESEARCH BASED TEACHER EDUCATION

There are many approaches to teacher education (Kansanen, 2006), one of which is research-based approach. It is based on the notions that the knowledge base of the study programme is dynamic and that student teachers are active processors of knowledge (Zeichner, 1983, p. 7). These are the crucial reasons why we consider the structures and processes of the student teacher's personal theory of education to be the basic elements of the curriculum. The idea is to integrate the theoretical aspects with practice during the studies. Research-based thinking is viewed as the connecting factor in this process. Identifying pedagogical elements and asking pedagogically meaningful questions in educational situations are among the most important skills a future teacher needs. In line with Zeichner's definition, we have outlined four key determinants in our research-based teacher education. Firstly, the study programme is structured according to the systemic educational structure, secondly all teaching is based on research, and thirdly, activities are organized so as to give students the opportunity to practise argumentation, decision making and justification when inquiring and solving pedagogical problems. Fourthly, students learn different research skills during their studies when they proceed to the Master Thesis level. (Kansanen, Tirri, Meri, Krokfors, Husu, & Jyrhämä, 2000; Kansanen, 2004; Jakku-Sihvonen & Niemi, 2006; Krokfors, 2007.)

Through theoretical elaboration and through our research processes we have created a model of theoretical core elements of the research-based teacher education. It comprises two essential elements: the idea of two levels of teacher education and the characteristics of two-fold practice in teacher education.

Two levels of teacher education

In research-based teacher education programmes, there is the everyday practice which involves the mastering of common teaching. We call this the *basic level of teacher education* (see Figure 1.). The focus here is usually on the acquisition of the practical skills and fundamental knowledge that cover the whole instructional process, and a variety of subject matter pedagogical content knowledge courses. In the art of teaching, we could think about "natural forces" or "spontaneous forces" (cf. Gage, 1978; Kansanen et al. 2000, p. 147) which may automatically come into play when adults work with children. It may be possible to develop these everyday teaching skills over the years, and working as a teacher inevitably brings about learning in this respect, at least on some basic level (Kansanen, Tirri, Meri, Krokfors, Husu, & Jyrhämä, 2000). This kind of thinking partly explains why the belief that teachers are born – but not educated – still persists. In teacher education, the development of these skills is supported systematically and continuously.

Wilson, Floden and Ferrini-Mundy (2001) found that pedagogical content knowledge courses focused on basic subject matters significantly improved student achievement. However, after the basic stage additional courses did not produce same results any more. They call this a threshold effect, beyond which further effect is minimal at least in pre-service level of

teacher education. To develop the continuum of pre-service and in-service teacher education is another question, which should be seriously discussed. Teacher development needs time and should be considered as a life-long learning process.

Beyond this basic level in research-based approach, there is a need for a more *general level of teacher education* (see Figure 1.) which aims at the sustained development in teacher's work. Although connected to the basic level, general level takes a certain distance from the teacher's everyday practical work. This refers to reflection, thinking, discussion, and other research-related activities. (Kansanen, 2004). General level also implies a kind of meta-cognition of one's own work and pedagogical decision-making. It is not achieved without devoting special attention to the specific requirements, which we discuss in the following. Thus, research-based teacher education could be seen as a continuum from the basic to the general level.

Twofold practice

When we emphasise the research based idea as an organizing approach to teacher education on the general level we understand the practice as having a twofold character. The teacher's profession today presupposes two different dimensions to pedagogical practises: 1) to practise teaching and 2) to inquire or research one's own or other people's teaching (see Figure 1.). The second one, to practice inquiry is a new and complementary way to look at the theory-practice relations in research based teacher education. Both of these dimensions are evident in pedagogical situations, and the practice requires teaching skills as well as theoretical knowledge, reasoning and understanding. In the following we discuss these two aspects of practice in the context of basic and general level of teacher education.

Practising teaching

In most teacher education programmes, the student teachers have the possibility to practice their theoretical knowledge in practical situations in real classroom settings. The focus of teaching practice may vary, and practice periods may focus on subject teaching, classroom management, school as a community, or teacher's work in its wholeness. There are also differences in the role and responsibilities of a student teacher. Their experiences may vary from practising in university practising schools to other kind of partnership schools in which student teachers practise in other teacher's class or even have a class of their own.

On the basic level, **practising teaching** means the implementation and application of the methods taught in teacher education courses. The basics of the pedagogical content knowledge of different subjects are applied in real and authentic classroom situations. In addition, the routines of classroom management and tips are tested in practise.

The aim of practising teaching is to move towards the general level of teacher education, which refers to teacher's pedagogical thinking, pedagogical decision making and justification. Teaching practice is an essential element of a student teacher's personal and practical knowledge formation, and integration with the theoretical core content is of high importance. The aim is to integrate theoretical and practical knowledge. Student teachers conceptualise their practical experiences as well as put theories and abstract ideas together with practical understanding. Teaching practice during teacher education forms an entity, and the main practising periods have their cumulative and expanding pedagogical focuses.

Supervision, counseling and mentoring, as well as peer coaching, are parallel methods used in order to promote pedagogical thinking and the student teacher's progression towards inquiry-oriented approach of teaching. The left side of Figure 1 shows the dual characteristics of practice on the basic and general levels of research-based teacher education.

Practising researching

While practice in school-based or traditional college-based teacher education is associated only with teaching practice, in academic research-based approach it also covers the activities of **practising inquiry and research** (see Figure 1.). Students need guided practice in order to acquire the skills to carry this out in pedagogically meaningful situations. Students also need theoretically oriented method courses, but they really need to work on with skills like observation, interview and interpretation. Knowing and action must be in reciprocal interaction especially when practising inquiry and research.

On the basic level, inquiry is not strongly associated with practising, and the role of the student is more passive in studying the basics of educational research methodology. The method courses start at the very beginning of the studies and small empirical investigations are integrated with the study of pedagogy and pedagogical content knowledge. The teaching covers quantitative and qualitative as well as mixed method research approaches. An idea of the curriculum as a spiral is implemented at this stage.

This spiral leads to the general level. The Master’s thesis that is conducted at the end of the study programme is an independent but supervised research project. It could also be seen as the integration of the theoretical knowledge base or theoretical knowing with the use of appropriate data collection and analysis procedures. Over the course of time, teachers’ work has been investigated by professional researchers as well as teachers themselves. When we look back at past decades we can see that Schön’s (1983) idea of the reflective practitioner did not guarantee that educational research would be open for teachers (Rudduck, 1985). Most of the research projects focusing on teacher’s work were carried out by researchers who were not teachers themselves. We suggest a horizontal rather than a vertical approach to the role relations between the actors.

	TEACHING	RESEARCHING
general level	<ul style="list-style-type: none"> ▪ metacognition ▪ reflection ▪ pedagogical thinking 	<ul style="list-style-type: none"> ▪ producing ▪ expertise
basic level	<ul style="list-style-type: none"> ▪ everyday thinking ▪ skills-based teaching ▪ teaching recipes, routines, tips 	<ul style="list-style-type: none"> ▪ adaptation ▪ consuming ▪ knowledge-based
	making pedagogical decisions	inquiring one’s own work
RESEARCH-BASED TEACHER EDUCATION		

Figure 1. The twofold practice on the basic and general levels of research-based teacher education.

When practice concerns teaching (Figure 1) it is a question of making pedagogical decisions. Practice in research, in turn, implies inquiry into one’s own work as a teacher. These both are the dimensions of research-based teacher education which aims at producing inquiry-oriented future teachers.

THE STUDY

The aim of the study

We conducted the study at the Department of Applied Sciences of Education at the University of Helsinki in the beginning of year 2007. In principle, the department is committed with the research-based approach in teacher education. The five-year study programme in teacher education is academic. All primary school student teachers conduct MA thesis as a part of their studies. Despite of these general conditions, it is not self-evident that all the teacher educators of the department share this commitment. This was our reason to carry out the research.

Research questions:

- 1) How much do the teacher educators appreciate the research-based approach in teacher education?
- 2) How do the teacher educators define and understand the research-based approach in teacher education?
- 3) How do the teacher educators understand the connections between the research-based approach in teacher education and teacher's everyday work?

Data and methods

We used a sequential mixed method design (e.g. Tashakkori & Teddlie, 2003; Creswell, 2003) consisting of three phases. First, in 2005 and 2006, the primary school student teachers were surveyed (Kynäslahti, Maaranen, Krokfors, Jyrhämä, Byman & Toom, 2007). For the second phase, we modified the survey in order to make it suitable for the teacher educators and conducted it in the spring of 2007. It comprised all together 25 items, four background questions, 20 statements graded on 1-7 Likert scale from one to seven (1=highly disagree, 7=highly agree) and one open-ended question.

The survey was targeted at the teachers of primary teacher education programme (N=52). Several of them also taught in subject teacher education programme or in special education. The number of the respondents was 33 (female 61%; male 39%), thus making the response rate 63%. Because of the small number of the respondents we used only descriptive statistics when examining the data. With these results we answer to the first research question.

On the basis of the survey results we interviewed a selected sample of eight teacher educators in order to explore how they understand the concept of the research-based approach and what kind of relevance they thought this approach may have to teacher's work. The interviews were structured thematically based on an analysis of the responses to the open-ended question in the survey.

Two researchers interviewed eight members of the department staff; three females and five males. Eight teacher educators (one research assistant, three university lecturers and four professors) were interviewed about their understanding of the research-based approach to teacher education. They were all active teachers on the primary school teacher education programme. The data was analysed using qualitative content analysis. Expressions were analyzed according to the meaning they conveyed. The data was analysed by using qualitative content analysis. As a result of the first phase of analysis, 61 different categories concerning the basics of the research-based approach were defined. These categories were grouped together into more general entities. In the final phase of analysis, four elements of research-based approach were interpreted. By the analysis of qualitative data, we answer to our second and third research questions.

RESULTS

Teacher educators' appreciation of the research-based approach

In the first research question we were interested in the teacher educators' attitudes and appreciation towards the research-based teacher education. The descriptive statistics indicate that the teacher educators' attitudes towards the research-based approach were positive. They appreciated it as an organizing theme for the primary school teacher education programme. The means and standard deviations of all the items are presented in Table 1.

Table 1. The means and standard deviations of the questionnaire items.

Items	<i>M</i>	<i>SD</i>
1. It is important that the research-based approach is realized in courses of the didactics of the subjects which are taught in elementary school.	5.52	1.716
2. It is important that the research-based approach is realized in courses of the didactics of arts, music, craft and physical education.	5.18	1.704
3. It is important that the research-based approach is realized in courses of the didactics of history, religion and philosophy.	5.45	1.641
4. It is important that the research-based approach is realized in the course of the didactics of mathematics.	5.42	1.542
5. It is important that the research-based approach is realized in courses of the didactics of Finnish.	5.55	1.481
6. It is important that the research-based approach is realized in courses of education as the major subject.	6.39	1.029
7. It is important that the research-based approach is realized in Bachelor's thesis seminars.	6.61	.704
8. It is important that the research-based approach is realized when a student is working with his or her own Bachelor's thesis.	6.70	.585
9. It is important that the research-based approach is realized in Master's thesis seminars.	6.97	.174
10. It is important that the research-based approach is realized when a student is working with his or her own Master thesis.	6.94	.242
11. It is important that the research-based approach is realized through the required reading of education as the major subject.	6.24	.902
12. It is important that the research-based approach is realized in the supervising and counselling of the subject didactic practicum.	4.97	1.571
13. It is important that the research-based approach is realized in the supervising and counselling of the final practicum.	5.52	1.460
14. It is important that the research-based approach is realized in all courses.	5.42	1.347
15. It is important that the research-based approach is realized in the courses of my own subject.	6.06	1.248
16. It is important that methodological studies form a coherent entity.	6.61	.827
17. It is important to have courses on research methodology from the beginning of the studies.	4.82	1.685
18. Methodological studies should provide students with a variety of different methods.	6.42	.751
19. It is important for me that the students have the possibility to continue their studies towards doctoral studies.	5.91	1.284
20. An official qualification for primary teaching should be earned through a lower degree than the Master's degree.	2,12	1,691

The respondents were like-minded and considered that the research-based approach is realized best when the students are engaged in their own research work. The items reported here are those with the highest or lowest means and/or standard deviation. Items 7, 8, 9, and 10 recorded the highest means and lowest standard deviations of the data, and they all dealt with courses related to conducting research.

It is important that the research-based approach is realized in Bachelor's thesis seminars. (Item 7, *M* 6.61, *SD* .704)

It is important that research-based approach is realized in when students are working on their own Bachelor's thesis. (Item 8, *M* 6.70, *SD* .585)

It is important that the research-based approach is realized in Master's thesis seminars. (Item 9, *M* 6.97, *SD* .174)

It is important that the research-based approach is realized when a student is working with his or her own Master thesis. (Item 10, *M* 6.94, *SD* .242)

In addition, there were three interesting findings that were also related to the methodological studies.

Methodological studies should provide students with a variety of different methods. (Item 18, *M* 6.42, *SD* .751)

It is important that methodological studies form a coherent entity. (Item 16, *M* 6.61, *SD* .827)

It is important to have courses on research methodology from the beginning of the studies. (Item 17, *M* 4.82, *SD* 1.685)

The descriptive statistics presented before show a high agreement among the respondents. This indicates that they appreciated the wide variety of methodological studies and the systematic way in which they are organized. Still, not all of them thought it is important to teach the students in research methodology early on.

Item number 20 recorded the lowest mean suggesting that most of the respondents thought that primary school teacher education requires a Master's degree. However, nearly 40% of the respondents did not totally agree with this statement.

An official qualification for primary teaching should be earned through a lower degree than the Master's degree. (Item 20, *M* 2.12, *SD* 1.691)

All together the means varying from 4.82 to 6.97 indicate that research-based approach is important and highly appreciated among teacher educators. In studies of pedagogy of the school subjects the means vary from 5.18 to 5.55 when the range in studies of education is from 6.24 to 6.39. This may indicate that the research orientation is not seen as obvious in the pedagogical content knowledge courses as in courses of the major subject, education. Also the subject didactic practicum has a lower mean (4.97) than the final practicum (5.52), which supports the same interpretation. Still, it is noticeable that all teacher educators thought that the research-based approach is important in their own subject, the mean being over six (6.06) and the standard deviation 1.248.

Teacher educators' understanding of the research-based approach

In second research question, we aimed to know how teacher educators understood the research-based approach. Research-based teacher education was seen to have elements ranging from the broad level of teacher education to a more personal level of a teacher (see Figure 2). It was seen as

1. The context – Academic teacher education
2. The approach – Main organising theme of teacher education
3. The content – Curriculum of teacher education
4. The aim – Teacher's pedagogical thinking

In the following we will open these elements.

The context – Academic teacher education

This dimension of research-based approach in teacher education concerned the special context of higher education. Research-based teacher education is a part of the academic university curriculum. In other words, its origins are not just in the history of teacher education but also in the pedagogy of higher education, and in the principles how academic studies are organised, in general.

[By doing research] we take our place in the university, without research we wouldn't be here ..., to be academic always means that there is research involved. (Interviewee 6)

Everything we do here is based on research and we sort of use the results to justify our views. (Interviewee 4)

There are certain conceptual differences related to the pedagogy of higher education. What is typical of university teaching is that the teachers conduct research on the subject they teach. A university teacher of mycology, for example, conducts research on mushrooms and bases his or her teaching on this research. Hence, teaching in university, including teacher education, is 'research-based'. In other words, research-based teacher education also refers to the teaching provided by teacher educators. The interesting thing is that in the case of teacher educators the subject they conduct research is teaching. For a teacher educator, the subject of the teaching and the target of the research is the very same. In that sense, research-based university teaching of teacher education as an educational field differs from research-based university teaching in other disciplines.

The approach – Main organising theme of teacher education

The respondents understood the research-based approach to represent a general view of teacher education, even like a mantra. It was recognised as a commitment to and a profile of the department.

An inquiry-oriented teacher ... has been a sort of mantra [in our department] for some twenty years now coming from America, and I think that it is a very important thing. (Interviewee 6)

The content – Curriculum of teacher education

One aspect of the understanding of research-based approach concerns the contents of the study programme. In other words, in order to be research-based, teacher education must include studies that incorporate it. This includes educational theory, methodology and methods as well as work on Bachelor's and Master's theses and reading educational literature.

How [the research-based approach] appears in the studies, it's the Master's thesis that the students makes on his or her own, and the methodological studies ... It is typically a part of the thesis work for the student to familiarise himself or herself with the research literature, and courses on educational theory also help as well as reading books. These all provide the student with a basic understanding of educational research and its wider context. (Interviewee 7)

The importance of methodological studies was underlined but there was also some criticism suggesting that students' skills and knowledge within this area, especially in quantitative research methods, were not sufficient.

Teaching of research methods has been growing down like a cow's tail. You can not expect the same kind of research skills [than before] from the students because there are not enough courses in which the art of making research would be taught in the way that it used to be taught. ... It is quite sad that I constantly end up noticing that when I ask some basic things, nobody knows anything. And that is not is their [the students] fault. (Interviewee 6)

The aim of methodological studies in teacher education curriculum was seen as two-fold. The dual role of teachers as consumers and producers of educational research was seen as an important issue in the study content of future teachers.

A student who completes his or her studies in our department should be able to read different kinds of research texts and they need to understand educational research and research in educational psychology in order to get a perspective for their own work as a teacher. This means that students need up-to-date knowledge of the academic field. On the other hand, nowadays the teacher is required to produce various kinds of texts and papers that are research-oriented. (Interviewee 4)

Research-based teacher education was understood to provide students with the means to carry out research and, indeed, they behave like researchers during their studies. They write their own Bachelor's and Master's theses, for example. This kind of producer capability is also recognised in the teacher's competence these days. However, the producer aspect is not the main goal because; like one interviewee said '*We are here not to produce researchers*' (Interviewee 6). The study programme is seen to pave up the way for understanding educational research and promote a positive attitude towards it.

The interviewees mentioned that although they understand and appreciate the research-based approach that does not necessarily mean that they know how to apply it in their own courses.

I am aware of that now that I am a part of [research-based teacher education] – this is what we have profiled to and what we have trumpeted – it isn't so easy to realize. I am not sure what it could mean in practice. (Interviewee 5)

The aim – Teacher's pedagogical thinking

The respondents thought that the goal of the research-based approach is to develop student teachers pedagogical thinking processes. This was alluded to in expressions such as 'critical thinking', 'didactic thinking' and 'pedagogical thinking'. Thus the main goal is not to educate researchers but to produce teachers who think and approach their work in an inquiring manner. This means that a teacher has to understand the educational concepts and be able to apply them correctly. Theoretical pedagogical thinking is applied in everyday practical settings. The teacher readily questions the way of working and takes a critical stance towards the routines of it. Instead of providing ready answers and tips, a research-based approach encourages stu-

dent teachers to make independent pedagogical decisions. The teacher was seen as a decision maker on several levels:

Given the numbers of pupils in the classroom, the teacher has to make several kinds of decisions at the same time and separately, dealing with pedagogy, aims, the curriculum ... technical details, as well as philosophical-social-historical issues. (Interviewee 4)

[In a teacher's work] there come situations which are new and unexpected and solving of them, ending up to different kinds of views of what these situations are all about and what lies behind them, and that sort of things, that is what research may, at its best, bring about in a form of pedagogically thinking teacher. (Interviewee 2)

This independence calls for autonomy, which in turn requires sufficient educational knowledge and professional self-assurance.

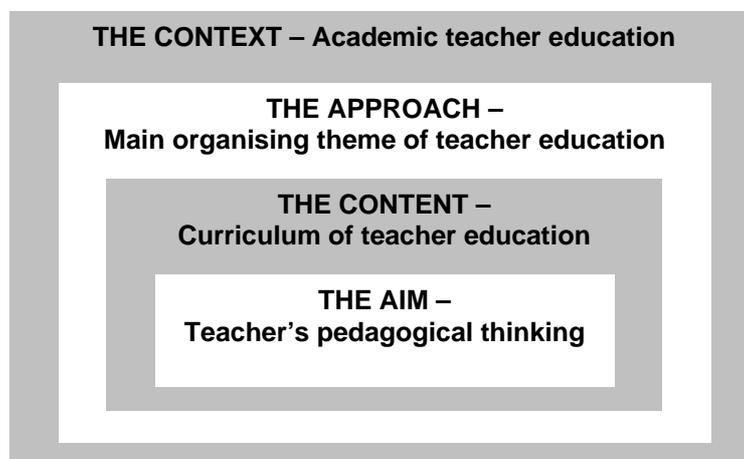


Figure 2. Teacher educators' understanding of the research-based approach.

The relevance of the research-based approach to the teacher's work

In the third study question we were interested in to know whether the teacher educators thought the research-based approach to have any relevance to the actual every day work of teachers. According to the interviewees, the research-based approach is clearly relevant to the teacher's work. They argued that the nature of the teacher's work has changed: teachers are actively involved in curriculum development and different evaluation processes. The school itself has changed.

The teacher should constantly be sensitive in realising how the world is changing and how teacher profession should change. There are a number of factors on the school level: schools are creating their own profiles to suit for pupils and their parents, depending on the school environment. So, there's not just one way of carrying out a teacher's work. Being an inquiry oriented teacher means perceiving your environment. A teacher is a sort of societal actor who makes sustainable decisions and questions of the very basis of his or her work. (Interviewee 1)

The school is a place where several professions meet and the teacher's work includes trans-professional collaboration with colleagues, such as the school psychologist, pre-school teachers or those engaged in health care. The interviewed teacher educators claimed that school was no longer the static workplace for which the teacher education at the time prepared stu-

dents. More dynamics is needed, partly because of the emphasis on self-development and management.

A student teacher and the future teacher should be aware of the structures affecting the work, which are reflected in the activities in the classroom. (Interviewee 4)

A teacher who is well versed in educational research, I think is better able to analyse the problems that come up in the classroom and to find answers, just like all professional people do, by reading literature instead of just sort of getting depressed about it and hoping it will go away. (Interviewee 7)

Speaking of self-development, a [inquiry-oriented] teacher is able to develop herself in a better than one who just has a set of familiar old tools – but what happens when something new comes up? (Interviewee 1)

Although the teacher educators recognized relevance of the research-based approach, they were also aware that students might not see this connection.

For a student it may be difficult to see, in the beginning [of the studies] to perceive, for which purposes she or he needs research. It may be so that if it [the research-based approach] rolls too early so ... there is a danger that it may appear as mannered and irrelevant causing a reaction of 'Surely, I will not be a researcher. Isn't this just odd. Why are they talking about those things? A school is somewhere else'. It [the research-based approach] should be introduced in appropriate pieces. ... If 'research and research again' is repeated and repeated it may work against itself because many of the students have problems enough with the practice [of a teacher's work]. (Interviewee 4)

CONCLUSIONS

Different kinds of teacher education programmes have been investigated through meta-analyses. As a result, Zeichner and Conklin (2005, 702) state that there is not any specific way to organize teacher education, which would be better than the others. Different programmes serve different purposes. Rather, teacher education units should make it explicit to what they are aiming with their programmes. The results that we have presented in this article may provide some guidelines how to organise teacher education with a research-based approach.

The results indicate that teacher educators appreciate the research-based approach as the main organising theme. Most of the respondents thought that a five-year study programme with Master's degree was appropriate qualification for a primary school teacher. They also felt that this approach was best realized in the students' own research work. Although they agreed that methodological studies should form a coherent entity with a range of both qualitative and quantitative methods, not all of them thought they should start early on. The qualitative analysis shed some light on this interpretation: it became apparent that these studies should be introduced carefully to the students with reference to the teacher's everyday reality. It came out in the interviews that a strong focus on methodology and educational theory in general in the early stages might frighten the students, who may not see the relevance of the studies with the teacher's work. It is important to emphasise the way new students are introduced to methods and methodology. In the beginning, an unpractical and theoretical way of teaching methods is not recommended and has to be substituted with problem-based practical approaches. Inquiry has to have a pragmatic orientation and a strong connection to students' perceptions of everyday practice. More complicated formal dimensions to both qualitative and quantitative research work can be introduced later when students have created a pre-understanding of inquiry and research

Interestingly, the research orientation was not seen as obvious in the pedagogical content knowledge courses as in courses of the major subject, education. This is probably because the teacher educators of content knowledge and pedagogy of content knowledge themselves have majored in their special subject and the relevance of research-based approach in education and pedagogy is not as clear to them as to those who have studied education as a major. Despite of that all interviews confirmed the importance of the research-based approach, and the need for a general level of it. The teacher educators emphasised this in several ways and some of them insisted that other, less ambitious thinking was not appropriate in today's educational world.

The status of teacher education as an academic subject was also mentioned as one of the main elements of research based teacher education. Academic means that research and inquiry are expected both from students and teachers. In the student's case this refers to studies in educational theory and methodology, as well as to their own thesis work. For the teacher educator, however, it is more complex. A university teacher is both a researcher and a teacher – this applies not only to teacher education but also to university teaching in general. Researching is expected of all university teachers. However, teacher educators are one of the few groups of teachers for whom inquiring into one's own work, as a university teacher is reality: the target of the research is teaching and learning and that is what the educator is doing. In our interpretation the research-based teacher education paradigm implements a dimension with activities of academic research and at the same time the pedagogical goal of it is to educate practitioner researchers, teachers who develop their work through practical inquiry. (cf. Richardson, 1994; Zeichner & Noffke, 2001.)

When the interviewees reflected on the teacher education curriculum the aspects of consumers and the producers of pedagogical knowledge emerged. The teacher educators emphasised the former as a goal for the pedagogical practice in the inquiry-oriented approach. They stressed they do not produce mere researchers, but rather teachers who understand and are able to apply educational research literature. On the general level of teacher education the producer aspect was apparent. Nowadays teachers are producers of demanding educational texts, for example in the context of curriculum development. In the research literature the aspects of producing and consuming educational knowledge has been discussed very often as opposites (Galluzo and Pankratz, 1990). According to our interpretation of the research-based teacher education they rather can be seen as dimensions of it. Academic researchers produce different kind of educational knowledge than practitioner researchers when they inquire their own work and everyday teaching, studying and learning practices, and both of these are needed.

According to the results, the main goal of the research-based teacher education is to produce pedagogically thinking teachers. The dual nature of practice reveals the dynamics between researching and teaching: the former supports the latter, and inquiry-oriented thinking lends a helping hand. Rational pedagogical thinking empowers teachers to do their own pedagogical decisions. It is also a way for teachers to develop actively their practice and personal practical theories of education. In our interpretation of research-based approach the idea of thinking as action is emphasized and theory-practice relationship is seen transactional. (See also Biesta and Burbules, 2003). We can also refer to this kind of development by considering the concept of human agency. The power to act, not only react and repeat given practices is important. Like Lipponen, Virtanen, and Särkkä (2007) argue, if we want to educate teachers with agency we as teacher educators need to understand more deeply how to support the development of agency.

It is no longer enough to give only ready answers and tips, and in today's changing society teachers constantly come up against new situations, and confront problems to which they must find solutions by themselves. In our study, the research-based approach was not

emphasised to be an academic ivory tower. It was considered to have a significant relevance to teaching practice. In research-based approach to teacher education the study programme needs to be seen dynamic and the role of the student teacher as an active one. In our interpretation the study programme is structured according to the systemic educational structure, all teaching is based on research, and activities are organized so as to give students the opportunity to practise argumentation, decision making and justification when inquiring into and solving pedagogical problems (Krokkfors, 2007). Teaching in today's world needs dynamic competences and a high level practice calls for the kind of inquiry-oriented approach that reflects the general level of research-based teacher education.

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