Vol 8, No. 2, December 2012, pp. 23-44

Reflecting Education
http://reflectingeducation.net

# Relationships of Teachers' Professional Competences, Active Learning and Research Studies in Teacher Education in Finland

*Hannele Niemi*
*University of Helsinki, Institute of Behavioural Sciences*

## ABSTRACT

The article provides research-based knowledge on the quality of teacher education in Finland. The study is based on an empirical survey among student teachers in two universities. The research questions aimed to find out how teacher education has provided student teachers with competences for a high quality teaching profession and what kinds of relationships can be found between different competences. It also investigated what relationships can be found between professional competences and active learning methods used in teacher education, and between professional competences and research studies in teacher education.

The highest professional competences have been achieved in the following skills: designing of instruction, critical reflection on one's own work, becoming aware of the ethical basis of the teaching profession, lifelong professional growth, self-evaluation of one's own teaching, using teaching methods, and development of one's own educational philosophy. The strongest relationships exist between active learning and the professional competences in those tasks that require a strong reflective orientation and commitment to the teaching profession. Student teachers see that research studies had contributed to their professional development. The most important abilities they had learnt through research studies were: critical thinking, independent thinking, inquiry, scientific literacy and questioning phenomena and knowledge. The student teachers see research studies as valuable for the teaching profession and regard their future work as continuous developmental task. Research studies also received criticism. The quality of teaching and arrangements were not always good enough. There is also a need to strengthen teacher education to provide more skills to student teachers for cooperation with partners outside a school community and for tasks outside classrooms.

## INTRODUCTION

In knowledge-based societies, research and evidence-based policy and practice have become an urgent requirement. Decisions and development should be based on the best available knowledge. The OECD and the European Union have promoted this approach in different sectors of society, calling different disciplines to give their contribution.

This study aims to provide research-based knowledge on teacher education. It provides feedback by student teachers in teacher education programs of two universities in Finland. The study is on the question of how teacher education can provide teachers with competences that are important in a profession undergoing many transformations due to new knowledge-creation modes, changing learning environments, and local and global societal changes (e.g. European Commission, 2011; Asia Society, 2012). The research presented in this article has two functions: firstly it aims to explore how teacher education programs have succeeded in their mission to educate high quality teachers and secondly what kind of qualities prospective teachers have for evidence/research based work in their

 ISSN 1746-9082

profession. The article describes empirical results of quantitative and qualitative measurements among student teachers focusing on their professional competences and their experience of active learning methods and research studies as part of teacher education programs.

## Contextual frame

Finland is an example of research-based teacher education. The responsibility for providing education for prospective teachers at primary and secondary schools rests with universities. In 1979, the basic qualification for secondary and elementary school teachers was defined as a Master's degree in the form of programmes requiring four to five years of study. The purpose of this modification was to unify the core aspects of elementary and secondary school education, and to develop an academically high standard of education for prospective teachers. Teacher education for the secondary school level was also reformed by expanding the scope of pedagogical studies (Niemi & Jakku-Sihvonen, 2006).
The Finnish education system has received attention from all over the world because of PISA surveys. Finnish 15-year-olds have been number one in terms of skills in mathematics, scientific knowledge, the reading of literature and problem solving, and only very few students fall within the lowest PISA categories. Likewise, differences between schools are small. A major reason for high learning outcomes can be seen as a result of a purposeful educational policy and a high standard of teachers. According to researchers (Välijärvi, 2004; Simola, 2005; Laukkanen, 2006; Niemi & Jakku-Sihvonen, 2006), educational policy has purposefully aimed at equity in education and has promoted the common comprehensive school model. In the process, many important decisions have been made. One of those has been the decision to raise primary school teacher education to MA level.
Teacher education has proven to be a very attractive option for talented students. Competition for teacher education is stiff with only around 10 – 15% of applicants being accepted on the study program (Niemi & Jakku-Sihvonen, 2011; Kansanen 2003: 86 – 87). Thus, it is fair to say that the teaching profession is popular. Lately, we have seen that a career as a teacher in Finland is the most popular choice amongst those leaving upper secondary education.
The main elements of teacher education curriculum are studies in:

- Academic disciplines. These can be whatever disciplines are taught in schools or educational institutions or in science of education. Academic studies can be a major or minors depending on the qualification being sought.
- Research studies consist of methodological studies, a BA thesis and an MA thesis. These elements comprise almost one fifth of all studies in teacher education seminars. Studies can also have connections with teaching practice, e.g. in action research projects and data collections in schools.
- Pedagogical studies (min. 60 ECTS) are obligatory for all teachers. They also include teaching practice that amounts to at least 20 ECTS. Teaching practice is started at a very early stage of study and is integrated with other studies. Teaching practice takes place mainly in universities' teacher training schools and is supervised by well-trained mentors.
- Communication, language and ICT studies are also compulsory.

- The preparation of a personal study plan is a new element in university studies in Finland. Its main function is to guide students to develop their own effective programmes and career plans, and to tutor them in achieving their goals.
- Optional studies may cover a variety of different courses through which students seek to profile their studies and qualifications.

There is a strong research-orientated component in pedagogical studies as well as in subject matter studies in the teacher education programmes of both universities. All students have to write both BA and MA theses in their major field of study. Class teachers take a Major in educational sciences. Subject teachers take a Major in academic subjects and a minor in Education. Teaching practice is integrated with pedagogical studies from the beginning.

Professors and supervisors of Finnish teacher education have the responsibility to guide students in the research-orientated aspects of their education. The main object of this guidance is not the completion of the B.A. or M.A. thesis itself, but actually to further the process by which students come to see themselves as actively studying and working subjects. In this aspect of the degree programme, the processes of active working and thinking are integrated in various complex and sometimes unexpected ways. The aim of the guidance process is to help students discover and tap into their own intellectual resources and to make them better able to utilise the resources of the study group with which they work (Niemi and Jakku-Sihvonen 2006: 37).

Active learning has been investigated earlier (Niemi, 2002) in the context of Finnish teacher education. The outcomes gave signals to improve teacher education methods towards more active learning. Also, professional competences have been the focus of research within the context of Finnish teacher education (Niemi & Kohonen, 1995). In those studies the main results were that teachers had good pedagogical competences for teaching in classrooms but many skills needed outside classrooms and facing the diversity of students and their needs should be given more attention in teacher education.

During the last twenty years, Finnish teacher education has been evaluated systematically in many national and international evaluations. In addition, many research projects and doctoral dissertations on some components of teacher education have provided important knowledge for further development. The study in this article continues this tradition.

## Perspectives and theoretical framework

### *Teachers' professional competences*

The theoretical framework of teachers' professional competences is based on a concept that consists of a broad view of teachers' professional role in schools and society as a whole. It is based on paradigms that consider a teacher as a researcher and a reflective practitioner, and view teacher education as an inquiry-orientated process (e.g. Darling-Hammond, 2010; Carr & Hatrnett, 1996; Hargreaves, A., 1994; Hargreaves, D., 2000; Smyth, 1995; Oser 1994; Tabachnick & Ziechner, 1991; Schön 1991). In Europe, teachers' professional competences have been defined in many working groups and committees. The author has participated in the expert group that drafted "Common European Principles for Teacher Competences and Qualifications" (Memorandum, 2005; European Commission, 2007). The

group set competences on three main dimensions of teachers' work: human beings, knowledge and society. The teacher's task has been described in the following way (European Commission, 2006):

*Work with others*
Teachers work in a profession, which should be based on the values of social inclusion and of nurturing the potential of every learner. They need to have knowledge of human growth and development and demonstrate self-confidence when engaging with others. They need to be able to work with learners as individuals and support them to develop into fully participating and active members of society. They should also be able to work in ways, which increase the collective intelligence of learners and co-operate and collaborate with colleagues to enhance their own learning and teaching.

*Work with knowledge, technology and information*
Teachers need to be able to work with a variety of types of knowledge. Their education and professional development should equip them to access, analyse, validate, reflect on and transmit knowledge, making effective use of technology where this is appropriate. Their pedagogical skills should allow them to build and manage learning environments and retain the intellectual freedom to make choices over the delivery of education. Their confidence in the use of ICT should allow them to integrate it effectively into learning and teaching. They should be able to guide and support learners in the networks in which information can be found and built.

They should have a good understanding of subject knowledge and view learning as a lifelong journey. Their practical and theoretical skills should also allow them to learn from their own experiences and match a wide range of teaching and learning strategies to the needs of learners.

*Work with and in society*
Teachers contribute to preparing learners to be globally responsible in their role as EU citizens. Teachers should be able to promote mobility and co-operation in Europe, and encourage intercultural respect and understanding. They should have an understanding of the balance between respecting and being aware of the diversity of learners' cultures and identifying common values. They also need to understand the factors that create social cohesion and exclusion in society and be aware of the ethical dimensions of the knowledge society. They should be able to work effectively with the local community, and with partners and stakeholders in education – parents, teacher education institutions, and representative groups. Their experience and expertise should also enable them to contribute to systems of quality assurance.

In addition, the European Commission (2007) has emphasized that teachers must have competences to work in multicultural settings (including an understanding of the value of diversity, and respect for difference). Furthermore, as with members of any other profession, teachers have a responsibility to develop new knowledge about education and training. In the context of autonomous lifelong learning, their professional development implies that teachers:

- continue to reflect on their practice in a systematic way;
- undertake classroom-based research;

- incorporate the results of classroom and academic research into their teaching;
- evaluate the effectiveness of their teaching strategies and amend them accordingly;
- assess their training needs themselves.

These European aims and competences have given a basis to the measurements in this study. In addition the survey includes competences that are very important in Finnish educational policy. These are, for example, equity, teaching as an ethical profession, teachers as learners and their active role in developing educational policy and in society. In Finnish teacher education the aim is that teachers can work as independent professionals in schools and give their active contribution in educational issues including development of school curriculum as well as formative and summative assessments of students' learning. These competences require strong expertise and integration of different kinds of knowledge.

### *Active learning in teacher education*

How to get students to become more active learners is a very common problem in many countries. Active Learning research has revealed that teachers who wanted to tutor their pupils to become active learners gained a new pedagogical role (Niemi, 2002). They became facilitators, who gave more responsibility to students. They were more democratic; they negotiated more with students about aims, methods and control of learning. They saw, more than before, all learners as resources for each other. New teaching methods, which consisted of more independent learning, more collaborative arrangements, more open tasks and projects, enabled students to collaborate with each other, but very often a teacher was also a partner in a learning team. A teacher's position was no longer in front of the classroom, nor in the centre of the classroom, but s/he was a circulating expert, learning together with students and trying to give as much space as possible to his/her students. To promote active learning, the teacher should be a tutor. In addition to the teacher, other partners (e.g. peers, parents, employers) in networks and co-operative projects should have a tutoring and supporting role. These scenarios of teachers' work create new demands on teacher education.

Niemi has investigated active learning in schools and teacher education (e.g. Niemi, 2002). The research focused on the Finnish case of active learning in teacher education and found that there are many factors, which are obstacles to active learning. Schools, as well as teacher education institutions, change very slowly. We carry our learning culture from the early days of our own school life, and it forms our concepts and ideals, which we regard as aims of learning.

The framework of active learning is based on theories that consider learning as constructivist and collaborative processes. The latest research considers learning an active individual process, but there is increasing evidence that learning is also a process based on sharing and participation with different partners in a community (Slavin, 1997; Scardamalia & Bereiter, 2003; Nonaka & Takeuchi, 1995). Knowledge is not an individual possession, but socially shared, and emerges from participation in sociocultural activities. Learning also requires social skills.

An active learning questionnaire consists of questions on independent inquiry, structuring and restructuring of knowledge, a problem solving orientation, a critical approach and an evaluation of knowledge. The goals of learning include the learner being able to elaborate on applications of knowledge and s/he may also produce new knowledge individually and collaboratively (e.g. Scardamalia, 2002; Sfard, 1998; Nonaka & Toyama, 2003). Active learners develop by examining their skills and by learning to reflect on, and control their own learning processes (e.g. Pintrich & McKeachie, 2003).

### *Research studies in teacher education*

The framework of research component in teacher education is based on the view that teacher education must prepare teachers to work using an evidence-based approach in their work (e.g. Schuller, 2006; Haeley, 2008) as well as possessing critical awareness of what kind of evidence they are using (Biesta, 2007; Sebba, 2004; Ozga, 2000**)**. This is possible only if they have the competence to use different kinds of evidence (e.g. Issitt & Spence, 2005), including the kind that research provides.

Even though teachers need many specific skills, they also need a comprehensive idea or vision of what their work as an educational expert means. Teachers need to understand the complexity of educational processes and see the evidence that comes from different sources. They need research-based and research-informed knowledge, but they also need to be open to acquiring and assessing local evidence. Scardamalia and Bereiter (2003) have examined the behaviour of experts. The feature that really distinguishes experts from others is their approach to new problems. The pattern recognition and learned procedures that lead to intuitive problem solving are only the beginning. The expert invests in what Bereiter and Scardamalia call progressive problem solving, that is, tackling problems. Rather than reducing problems to previously learned routines, this increases expertise. The aim of research studies in teacher education is that teachers could internalize an attitude like researchers in problem solving.

The critical scientific literacy of teachers and their ability to use research methods are considered to be crucial. Accordingly, Finland's teacher education programmes require studies of both qualitative and quantitative research traditions. The aim of these studies is to train students to find and analyse problems they may expect to face in their future work. Research studies provide students with an opportunity to complete an authentic project in which students must formulate a problem in an educational field, be able to search independently for information and data related to the problem, elaborate on these in the context of recent research in the area and synthesise the results in the form of a written thesis.

The aim is that they learn to study actively and to internalise the attitude of researchers as they do their work. The questionnaire consists of statements concerning how research studies have promoted skills and competences for teaching and on the teaching profession. The questions focused on critical knowledge inquiry and understanding and on the importance and limits of research based knowledge. In addition there were questions about teachers' responsibility to promote learning and education across schools and also more generally in society.

The research component is an essential part of Finnish teacher education. It comprises approximately 20% of the study of both elementary (major in Education) and secondary school teachers (major in Academic Subject). Despite difficulties in the eighties to integrate research studies with other components of teacher education, research methods and the writing of a Master's thesis are among the best parts in elementary school teacher education (e.g. Niemi & Kohonen, 1995; Niemi, 2002). The general result of the evaluations was that the more demanding the studies were, in terms of interrogating the quality of learning, the more useful they were.

### Research questions

The study investigates the following questions:

1) How has teacher education provided student teachers with competences for a high quality teaching profession?
2) What kinds of relationships can be found between different competences?
3) What relationships can be found between professional competences and active learning methods used in teacher education?
4) What relationships can be found between professional competences and research studies in teacher education?

## METHODS AND MODES OF INQUIRY

The method of the study was both quantitative and qualitative. Student teachers in two universities participated in the research. They assessed how teacher education had provided them with professional competences needed in a high standard profession through a web-based survey (40 questions with a scale of 1-5). They also assessed what kinds of experiences of active learning they have had and how often these methods were used (20 questions with a scale 1-5). There were also open-ended questions about strengths and weaknesses of their TE from the viewpoint of active learning. The quantitative data was analysed using descriptive statistics including ANOVA. In addition, correlate and multivariate methods are applied. Data reduction methods such as Factor Analysis are used (Principal axel method with Varimax and Promax rotations) in the analysis of questionnaires. New variables were created based on their homogeneity (Cronbach's Alpha) and theoretical validity and relevance. The qualitative data has been analysed using content analysis techniques**.**

### Data sources

The data was collected from among students of class teacher and subject teacher education programs at the Universities of Helsinki and Oulu. The departmental mailing lists were used in the data gathering. The students could assess their teacher education programs anonymously.

The web-based surveys were sent to all student teachers in the beginning of May and website was open until June 4, 2010. Two reminders were sent to the mailing lists. The

total official number of student teachers in both universities is approximately 1450 consisting of 1000 class teachers (all students in 5 year programs) and 450 subject teachers of one-year pedagogical studies. The exact number of students is very difficult to estimate because students have a lot of freedom to make their own personal study plans, which can shorten or lengthen their study times. 605 students visited the web-based interview sites, but the number of students who actually responded varies between sets of questionnaires and open-ended questions, around 30-42% of the total number of student teachers. In terms of general answering rates of Web surveys we may deem the achieved rate good or at least satisfactory. The background information about the respondents has introduced more detailed in the Table 1. The total number of students in this study is 454 in professional competence surveys. The number of students decreases towards the end of the web questionnaire where active learning and research studies questionnaires were located.

| | f (%) | | f (%) | | f(%) | f(%) | f (%) |
|---|---|---|---|---|---|---|---|
| University | University of Oulu 223 (40,2%) | | University of Helsinki 332 ( 59,8 %) | | | | |
| Gender | 91 Males (16%) | | 464 Females (83,6%). | | | | |
| Program | 313 class teacher students (56,4%) | | 236 subject teacher students (42,5%). | | | | |
| Age | <25 years 268 (48,3%), | 25-43 235 (42,3%), | 35-44 39 (7%) | 45-55 13 (2,3%). | | | |
| Phase of studies | 1 year 187 (33,7%) | 2 years 128 (23,1%), | 3 years 74 (13,3%), | 4 years 69 (12,4,%); | 5 years 55 (9,9%), | 6 years 22 (4%) | >6years *n* = 20; (3,6%). |
| Representatives of different school subjects | Math and Science 212 (21,8%), | Foreign languages 81 (14,6%) | Mother tongue 61 (11%) | History and Social sciences 32 (5,8%) | Religion and Ethics 33 (5,9%), | All other major options 112 ( 20,2%). | |

**Table 1:** Students in the Web-based survey. Average time in answering in the study was 51 minutes, median 24 minutes.

## Ethical principles

The study has been conducted following ethical guidelines of the National Advisory Board on Research Ethics (2009) in Finland entitled "Ethical principles of research in the humanities and social and behavioural sciences and proposals for ethical review". The principles are in line with ethical guidelines of European Educational Research Association

**(**EERA) for upholding high academic and professional standards. The main principles have been: The study respected the autonomy of research subjects. Participation was absolutely voluntary and anonymous. The study avoided any harm to the participants. Their teachers or professors did not know who the participants were and there could not be any positive or negative consequences because of answering to the web-based survey. Privacy and data protection was ensured. Identification of individual participants is impossible and the data is restored following ethical guidelines of the University of Helsinki. The student teachers were given as information about the researcher's contact information, the research topic, the method of collecting data and the estimated time required, the purpose for which data was collected, how it was archived for secondary use, and the voluntary nature of participation. They also could ask for additional information regarding the study and researchers.

## RESULTS

### Student teachers' professional competences and alpha

The mean values and standard deviations of professional competences are presented in Table 2. The highest professional competences have been achieved in the following skills: Designing of instruction, Critical reflection on one's own work, Becoming aware of the ethical basis of the teaching profession, Lifelong professional growth, Self-evaluation of one's own teaching, Using teaching methods, and Development of one's own educational philosophy. They all have the mean value of at least 3.5 and standard deviation is less than 1.00. These all are high-level professional skills and necessary for experts who develop their own work. Very close to these skills are the following competences: Mastering academic contents of curriculum, Independent management of teachers' tasks, Commitment to the teaching profession, Researching one's own work, Education of a student's whole personality, Critical assessment of teacher education, and Confronting multiculturalism. They all have a mean value that is at least 3.00. Student teachers were representatives of different year cohorts. The competences increased by years but the profile of means remained almost the same regardless of the year.

The student teachers achieved the weakest skills in administrative tasks and management of tasks outside a classroom (keeping an eye on students during recess, school festivals, trips, morning assemblies etc.). Also co-operation with parents, representatives of work life and cultural partners are weak, as well as working in cooperative action research projects, student welfare groups and in other school community groups. Acting in conflict situations (such as bullying) was also a weak competence. All these competences have a mean value under 2.5. A common feature of all these skills is some kind of cooperation with partners outside a school community or tasks outside classrooms.

The items of the professional competences were analysed by explorative Factor Analysis (Principal Axis) with rotations. The analysis revealed 4 or 5 latent new variables which all had high factor loadings. The new summative variables were created based on the 5-factor solution. Homogeneity values were high varying from .78 - .86. The five dimension solution was also the most informative and theoretically solid. It structured professional

competences into 5 meaningful components and these were named in the following way: Designing own instruction, Co-operation – teachers working with others, Ethical commitments in teaching profession, Diversity of pupils and preparing them for the future, and Teachers' own professional learning and growth. These new dimensions clarify teachers' professional competence areas and fit very well with the theoretical premises of Finnish teacher education and the European Union's objectives for the teaching profession. The structure also supports the fact that teachers' work takes place partly in classrooms, but a great deal of it outside in cooperation with other partners.

| **Summative variables with their items** | **Factor loadings** | **Com-munalities** | **Alpha** | **Mean** | **SD** |
|---|---|---|---|---|---|
| **Designing own instruction** | | | **.76** | **3.46** | **.59** |
| 1. Using teaching methods | .50 | .42 | | 3.54 | .764 |
| 17. Self-evaluating of own teaching | .51 | .59 | | 3.67 | .934 |
| 19. Designing of instruction | .67 | .47 | | 3.92 | .856 |
| 20. Independent management of teachers' tasks | .53 | .42 | | 3.39 | .926 |
| 30. Evaluating students' learning Capacity | .34 | .42 | | 2.77 | .852 |
| 31. Mastering academic contents of Curriculum | .50 | .33 | | 3.44 | .926 |
| **Cooperation – teachers working with others** | | | **.81** | **2.33** | **.58** |
| 2. Management of classroom interaction | .43 | .48 | | 3.03 | .926 |
| 3. Evaluating and grading of students | .37 | .36 | | 2.93 | .927 |
| 4. Management of tasks outside a classroom (keep on eye on students during recess, school festivals, trips, morning assemblies etc.) | .72 | .50 | | 1.79 | ,813 |
| 5. Working in a school community (teaching staff and other school personnel) | .63 | .50 | | 2.37 | .935 |
| 6. Administrative tasks (information letters, reports, student transfers to other groups or schools, work diaries) | .57 | .42 | | 1.67 | .771 |
| 7. Working with a student welfare group | .50 | .41 | | 2.28 | .877 |
| 18. Cooperation with parents | .52 | .43 | | 2.26 | .898 |
| 37. Acting in conflict situations (as mobbing) | .48 | .42 | | 2.37 | .935 |
| **Ethical commitments in teaching profession** | | | **.86** | **3.18** | **.63** |
| 8. Education of a student's whole Personality | .61 | .64 | | 3.23 | .943 |

| | | | | | |
|---|---|---|---|---|---|
| 9. Development of own educational Philosophy | .60 | .59 | | 3.46 | .977 |
| 10. Confronting changing circumstances of a school | .44 | .49 | | 3.07 | .914 |
| 21. Becoming aware of ethical basis of teaching profession | .57 | .53 | | 3.71 | .914 |
| 22. Commitment to teaching profession | .50 | .53 | | 3.39 | .948 |
| 23. Life long professional growth | .51 | .58 | | 3.69 | .896 |
| 36. Supporting a learner's individual Growth | .49 | .59 | | 3.07 | .917 |
| **Diversity of pupils and preparing them for the future** | | | **.86** | **2.91** | **.66** |
| 12. Differentiating of teaching | .53 | .47 | | 3.00 | .903 |
| 13. Providing readiness for students for daily life | .42 | .69 | | 2.88 | .897 |
| 14. Preparing students for a future Society | .45 | .73 | | 2.95 | .941 |
| 15. Intercultural education | .74 | .63 | | 3.00 | 1.001 |
| 16. Promoting equity of sexes | .53 | .55 | | 2.95 | 1.054 |
| 32. Confronting multiculturalism | .67 | .60 | | 3.16 | .985 |
| 33. Readiness for media education | .58 | .56 | | 2.89 | .906 |
| 38. Developing applications of modern information technology | .34 | .36 | | 2.98 | .956 |
| 40. Cooperation with representative of cultural life | .53 | .43 | | 2.42 | .976 |
| **Teachers' own professional learning** | | | **.85** | **2.88** | **.64** |
| 11. Developing of school curriculum | .28 | .40 | | 2.94 | .968 |
| 24. Critical assessment of teacher Education | .52 | .47 | | 3.23 | 1.153 |
| 25. Working as a change agent in a Society | .52 | .60 | | 3.69 | .896 |
| 26. Cooperative action research | .59 | .47 | | 2,28 | 1.008 |
| 27. Revising students' learning environments | .49 | .46 | | 2.90 | .934 |
| 28. Post graduate studies in education | .58 | .45 | | 2.63 | 1.024 |
| 29. Researching of own work | .56 | .59 | | 3.29 | 1.031 |
| 34. Self regulated learning | .40 | .54 | | | |
| 35. Critical reflection of own work | .44 | .62 | | 3.76 | .894 |
| 39. Cooperation with representatives of work life | .35 | .43 | | 1.85 | .792 |

**Table 2**: How well your teacher training/teacher education you have so far participated has provided readiness to you for teaching profession. (1 = very weakly, 2 = weakly, 3 = fairly, 4 = well, 5 =very well)

The mean values of the extracted factor dimensions confirm clearly what was seen in individual items. Student teachers have high competences for planning their own teaching and they are satisfied with content knowledge and using teaching methods. The results show that the ethical component is the second best competence area and includes very high commitment to the teaching profession. The Factor Analysis revealed also that an essential part of a teacher's professional work is facing the diversity of students. This means intercultural education, promoting equity of sexes and confronting multiculturalism. Overall it requires a different kind of teaching. In this Diversity component there is also the idea that teachers are preparing students for a future society and in this task they need readiness for media education, ICT and cooperation with representatives of cultural life. Unfortunately, this component does not have high values and most of its items remain under 3.00. The lowest competence area is professional co-operation. The major weaknesses are in cooperation with other school communities and other stakeholders, including parents. Interestingly, classroom management skills also fell into this category. This gives an urgent message to improve teacher education in this area.

**Active learning**

Student teachers had many active learning experiences. They had the following active learning experience the most often (Table 3): they worked intensively with their assignments, applied knowledge, and tried to understand matters and phenomena even though it would take extra time. They were tutored, if needed, but otherwise they worked independently or in peer groups. They discussed the best solution for the assignments and self-evaluated their own products. They also sought much additional knowledge. They had these experiences almost every week.

| **Active Learning methods** | **M** | **SD** |
|---|---|---|
| 1. We work intensively with our assignments. | 3.72 | .95 |
| 2. We have to apply knowledge. | 3.60 | 1.12 |
| 3. We try to understand matters and phenomena even though it would take time. | 3.49 | 1.09 |
| 4. We were tutored, if needed, but otherwise we work independently or in peer groups. | 3.48 | 1.05 |
| 5. We discuss together the best solution for the assignments.(+) | 3.44 | 1.10 |
| 6. We self-evaluated our own products. | 3.43 | 1.06 |
| 7. We seek much additional knowledge. | 3.43 | 1.12 |
| 8. We set objectives for ourselves and our learning. | 3.41 | 1.05 |
| 9. We know how to develop our own learning. | 3.35 | 1.11 |
| 10. We work in groups on problem-solving tasks.(+) | 3.25 | 1.12 |
| 11. We independently produce e.g. reviews, outlines of sessions, and presentations. | 3.24 | .92 |
| 12. We have to seek almost all knowledge independently from different information sources. | 3.20 | 1.15 |

| | | |
|---|---|---|
| 13. We use and apply knowledge very critically. | 3.19 | 1.26 |
| 14. We experiment and elaborate on new solutions to problems. | 3.08 | 1.09 |
| 15. We independently plan and carry out learning contracts for which we are responsible. | 3.02 | .98 |
| 16. We use electronic data basis and social media to seek knowledge for our assignments. | 2.94 | 1.24 |
| 17. We seek knowledge off campus. | 2.92 | 1.12 |
| 18. We have to elaborate on our assignments independently or in peer groups only based on a general theme. | 2.63 | 1.05 |
| 19. We have to take the responsibilities for planning and carrying out fairly large projects. | 2.40 | .99 |
| 20. We plan together the contents and working methods of study unit. | 2.39 | 1.30 |

**Table 3:** Active learning in teacher education**.** 1 = almost never, 2 = once or twice in a year, 3 = about once in a month, 4 = about once in a week, 5 = nearly daily

The active learning scale was analysed using correlations and factor analysis with Varimax and Promax (oblique) rotations. Correlations of all active learning items were significant (most over .30). It would have been possible to extract two dimensions of active learning: (1) Independent knowledge inquiry and creation individually and in groups and (2) Critical approach to knowledge and own learning. These factors correlated very highly (>.70) and therefore only one combined variable was constructed containing all 20 items (alpha= .93). This variable is used when we are searching relationships between active learning and professional competence.

Students were asked to describe what had been their best experiences in active learning. Writings of 253 students were analysed using content analysis techniques. Five main categories could be found. These are not separate but integrated with each other in many ways.

*Collaborative working culture*, active discussions with peers and professor/supervisors, knowledge sharing in coursework, examinations where a group is responsible for outcomes. (92 notes, 36 % from 253)

*Teaching practice*, to apply knowledge to teaching and learning, requiring own engagement and commitment. It also consisted of many notes about encouraging feedback from supervisors. The important features in teaching practice were opportunities to experiment, to work with pupils in schools. Many descriptions also consisted of ideas about collaboration with student teachers, supervisors and teachers who are responsible for theoretical studies of pedagogy. (76 notes, 30% from 253)

*Opportunity to own applications*, freedom to make own plans, design or develop large units for own or pupil's learning. (48 notes/19% from 253)

*Research studies* including writing BA and MA thesis, commitment to inquiry, learning a critical approach to knowledge. (35 notes, 13 % from 253)

*The large course units or programmes* that had been implemented throughout with active learning methods focusing on understanding phenomena in life and connections between different disciplines in a new and deeper way. (14 notes, 6 % from 253)

*Subject matter projects or subject matter pedagogy* related to different school subjects (39 notes, 15 % from 253), requiring independent inquiry or collaborative knowledge creation.

**Research studies in teacher education**

Student teachers were asked to assess how research studies had contributed to their professional development. The most important abilities they had learnt through research studies were: Critical thinking, Independent thinking, Inquiring, Scientific literacy and Questioning phenomena and knowledge. A general picture is very positive. Almost all variables have Mean >.3.00. The student teachers also see research studies valuable for the teaching profession and see their future work in this area as a continuous developmental task.
In the Factor Analysis two dimensions could be extracted and both have very high alpha-values. They were named as Critical research literacy (Aplha = .90) and Research for profession (Alpha .94). The former is at a slightly higher level than the latter, but both had high values giving evidence that the research component is important in teacher education. Critical research literacy with critical approach to knowledge and knowledge production has had an important contribution to the teaching profession and this is very much agreed with by student teachers. On the issue of Research for the Profession there are slightly more variations.

| **The summative variables and their items** | **Factor Load-ings** | **Commun-alities** | **Alpha** | **Mean** | **SD** |
|---|---|---|---|---|---|
| **Critical research literacy** | | | **.90** | **3.54** | **.75** |
| Development of readiness for inquiry | .69 | .58 | | 3.82 | .91 |
| Development of independent thinking | .81 | .75 | | 3.72 | .90 |
| Understanding research literature | .71 | .62 | | 3.67 | .95 |
| Questioning knowledge and phenomena | .72 | .65 | | 3.55 | .95 |
| Development of critical thinking | .77 | | | 3.55 | 1.01 |
| Conscientiousness of error sources of research | .51 | .37 | | 3.37 | 1.03 |
| Applying research knowledge into practice | .48 | .50 | | 3.14 | 1.08 |
| Development of methods for knowledge creation | .76 | .68 | | 3.45 | 1.02 |
| **Research for the profession** | | | **.94** | **3.13** | **.88** |
| Considering teaching profession of as continuous developmental task | .75 | .65 | | 3.43 | 1.12 |

| | | | | | |
|---|---|---|---|---|---|
| Considering working as a teacher as a continuous growth | .70 | .70 | | 3.27 | 1.18 |
| Becoming conscious of societal significance of teaching profession | .75 | .68 | | 3.19 | 1.14 |
| Increasing societal consciousness | .59 | .49 | | 3.14 | 1.07 |
| Understanding significance of research at classrooms and schools | .58 | .48 | | 3.23 | 1.11 |
| Increasing responsibility in teaching profession | .75 | .65 | | 3.11 | 1.17 |
| Understanding students' learning processes | .65 | .58 | | 3.09 | 1.17 |
| Increasing a teacher's ethical responsibility | .78 | .68 | | 2.66 | 1.52 |
| Research based development of schools | .59 | .49 | | 2.93 | 1.08 |
| Development of educational responsibility | .86 | .78 | | 2.50 | 1.43 |
| Clarification of significance of a teacher's work | .79 | .70 | | 2.89 | 1.11 |
| Development of my own personality | .71 | .49 | | 2.88 | 1.12 |

**Table 4**: Research studies in student teachers professional development.
1= very little. 2= little. 3= somewhat. 4= much 5= very much (N= 328-338. from which 51 students had answered 0 = I have not yet had research studies. these students have been subtracted)

Students had an opportunity to describe their own experiences of research studies. Some students were very critical and felt that the studies had been superficial and they would like to link them more tightly with practice. On the other hand some students valued research studies very highly but at the same time they may have thought that research studies took too much time in the whole program. Their comments and these findings were analyzed by content analysis:

There were some differences between class teachers and secondary school teachers. In the class teachers (88 responses) comments the following categories could be found: 1) Supervision was weak (14 comments). 2) Too much time for research studies. Took time away from other studies (22 comments). 3) Weak quality of research studies and problems in organizing and scheduling research studies to other studies (14 comments) and Too separate from practice (9 comments). In class teachers' comments there were 25 students who described research studies as very important and useful for teaching profession or their own thinking.

Secondary school teachers (55 responses) did not criticize the volume of studies and there were only 6 comments about research studies being too separate from practice. Instead, there were many (16) critical comments about the quality of studies and how they were organized. Some students felt that the studies had been superficial. The major problem was

that there was not enough cooperation between their subject matter faculty and the pedagogical faculty. This overloaded students and caused a lot of problems.

**Relationships between professional components, active learning and research studies**

When the relationships of the new sum variables of these professional competences were analyzed we got very high correlations. The dimensions are mutually dependent. The correlations do not indicate the cause nor the reason but we may interpret that these different aspects of teachers' work are supporting each other and together they form a spectrum for teachers' professional competence. The highest correlations exist with the ethical dimension of the teaching profession. This gives an important signal for teacher education to keep this element as an important part of programs.

| | N | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| Instruction design | 448 | 1.50 | 4.83 | 3.450 | .5942 |
| Cooperation | 441 | 1.00 | 4.38 | 2.327 | .5782 |
| Ethical | 444 | 1.25 | 4.88 | 3.184 | .6317 |
| Diversity | 448 | 1.11 | 4.78 | 2.913 | .6602 |
| Own prof. learning | 435 | 1.10 | 4.80 | 2.879 | .6427 |
| Active learning | 317 | 1.40 | 5.00 | 3.182 | .7087 |
| Critical research | 281 | 1.00 | 5.00 | 3.539 | .7453 |
| Research for prof. | 268 | 1.00 | 5.00 | 3.128 | .8750 |

**Table 5:** Descriptive Statistics of dimensions of professional competences, active learning and research studies

| | | Instruction | Co-operation | Ethical | Diversity | Own prof. learning | Active learning | Critical Research | Prof. research |
|---|---|---|---|---|---|---|---|---|---|
| Instruction | Pearson Correlation | . | | | | | | | |
| | Sig. (2-tailed) | | | | | | | | |
| | N | 448 | | | | | | | |
| Cooperation | Pearson Correlation | .532 (**) | 1 | | | | | | |
| | Sig. (2-tailed) | .000 | | | | | | | |
| | N | 436 | 441 | | | | | | |
| Ethical | Pearson Correlation | .627 (**) | .563 (**) | 1 | | | | | |
| | Sig. (2-tailed) | .000 | .000 | | | | | | |
| | N | 440 | 432 | 444 | | | | | |
| Diversity | Pearson Correlation | .503 (**) | .531 (**) | .690(**) | 1 | | | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | | | | | |
| | N | 443 | 436 | 439 | 448 | | | | |
| Own prof Learning | Pearson Correlation | .593 (**) | .469 (**) | .741 (**) | .638 (**) | 1 | | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | | | | |
| | N | 431 | 424 | 427 | 430 | 435 | | | |
| Act. Learning | Pearson Correlation | .282 (**) | .294 (**) | .415 (**) | .360 (**) | .508 (**) | 1 | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | | | |
| | N | 313 | 307 | 308 | 314 | 305 | 317 | | |
| Critical Re-search | Pearson Correlation | .352 (**) | .226 (**) | .379 (**) | .349 (**) | .465 (**) | .310 (**) | 1 | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | | |
| | N | 278 | 272 | 272 | 276 | 270 | 254 | 281 | |
| Re-search For prof. | Pearson Correlation | .228 (**) | .266 (**) | .438 (**) | .395 (**) | .435 (**) | .300 (**) | .631(**) | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |
| | N | 264 | 261 | 259 | 263 | 261 | 245 | 264 | 268 |

**Table 6:** Correlations of dimensions of professional competences, active learning and research studies

** Correlation is significant at the 0.01 level (2-tailed).

### *The relationships between professional competences*

The professional competences had very strong inter-correlations. The Ethical component had the highest relationships (.74 - .56). This supports the notion that the teaching profession is an ethical profession, which also makes it special. This view is supported by Oser (1994), Aloni (2002) and Niemi (2010). A tentative analysis of partial correlations revealed that the Ethical dimension is the most powerful variable to cause variation in other professional competences. This aspect needs further exploration in future studies.

### *Active learning and professional competences*

There are strong correlations between active learning and professional competences. Active learning is related to professional competences in a very interesting way (Table 2). The strongest relationships exist between active learning and the professional competences in the tasks that require a strong reflective orientation and commitment to the teaching profession (.41 - .36). These tasks are parts of the Ethical dimension as well as of the Diversity dimension. It means the more active learning, the more commitments and reflection and facing needs of diverse students and vice versa. The highest relationship exists between active learning and teachers own professional learning (.51): the more active learning the more professional learning.

### *Research studies and professional competences*

Both research components: Critical research literacy and Research for profession had high relationships with the Professional learning and the Ethical components. The only relationship that is under .25 is between Professional research dimension and designing one's own instruction. However, even this is statistically significant (.000). Research that is linked with teachers' professional work has strong correlations with the Ethical and Diversity dimensions.

### *Research studies and active learning*

Both research components had relationships with active learning at significant levels but correlations were .31 and .30. The more there was active learning, the more research-based learning and the more professional learning. The qualitative data support this result. Research studies also received criticism because the quality of teaching and arrangements were not good enough. Research studies have connections with the professional component but there are also indications that implementation of these studies should be improved.

## CONCLUSIONS

Finnish teacher education has had a high reputation because of student learning outcomes. The high quality is based on political decisions that have raised programs to a 5 years Master program. But it is also based on systematic evaluations and research on teacher education. This study wanted to seek feedback from student teachers in order to maintain quality in teacher education. The results yielded evidence that teacher education programs had succeeded in providing student teachers with competences that are highly important in

the teaching profession. The students had learnt practical pedagogical competences. They also had very strong ethical commitments to the teaching profession. They also saw the need for continuous learning. But their competences for cooperation inside and outside the school need to be strengthened. Teachers' work has become more co-operative and takes places outside classrooms in the school community and with many partners and stakeholders outside the school. This new professional culture must be taken seriously in teacher education.

Teachers' cooperative competences are low when looking at the whole group. However, the qualitative data showed the best active learning experiences emerge in collaborative working and study culture, in teaching practice and research studies. If we want to have teachers as strong professionals with cooperative skills, teaching and learning methods used in teacher education must be in line with this purpose. If we want to change schools towards more active learning in our global world, teacher education should promote these methods as well.

The research component had strong relationships with dimensions of Professional learning. The more research-based learning the more professional learning and vice versa. However, research studies also received criticism. The quality of teaching and arrangements were not good enough. This is an important area that should be improved in future. When promoting evidence-based practice, it is not enough that teachers are provided with information about research, offering it as a top-down process. They need the competence to acquire different kinds of evidence, which informs their practice and decisions. It seems that research, methodological studies and experiences of research processes have positive connections with a concept of a reflective and ethical profession.

This study provides validated instruments for further research in Europe. It would be important to see how the different components revealed in this research are found in other countries. The study also gives strong support for the importance of developing teacher education in such a way that it promotes the concept of teachers' wider professional competences covering interaction with different human beings and including the ethical dimension. In addition it is important that all these are implemented in close connection with research studies and using active learning methods.

## REFERENCES

Aloni, N. (2002). *Enhancing humanity. The philosophical foundations of humanistic education*. Boston: Kluwer Academic Publishers.

Asia Society (2012). Teaching and Leadership for the Twenty-first Century. The 2012 International Summit on the Teaching Profession. Asiasociety.org/teachingsummit. http://www2.ed.gov/about/inits/ed/internationaled/teaching-summit-2012.htm

Biesta, G. (2007). Why "What Works" Won't Work: Evidence-Based Practice and the Democratic Deficit in Educational Research. *Educational Theory*, 57 (1), 1–22.

Carr, W. and Hartnett, A. (1996). *Education and the struggle for democracy. The politics of educational ideas.* Buckingham: Open University Press.

Commission of the European Communities (2006). *Common European Principles for Teacher Competences and Qualifications.* June 5th 2006. : Directorate-General for Education and Culture. Brussels. Retrieved from http://www.seeeducoop.net/education_in/pdf/workshop/tesee/dokumenti/01-en_common-principles.pdf.

Commission of the European Communities (2007). *Improving the Quality of Teacher Education*. Communication from the commission to the Council and the European parliament 3.8.2007. Brussels: Directorate-General for Education and Culture. Retrieved from http://ec.europa.eu/education/com392_en.pdf.

Darling-Hammond, L. (2005). Teaching as a profession: Lessons in teacher preparation and professional development. *Phi Delta Kappan* 8 (3), 237–240.

Darling-Hammond, L. (2010). *The flat world and education. How America's commitment to equity will determine our future?* New York: Teachers College.

European Commission (2011). Policy approaches to defining and describing teacher competences. Thematic Working Group 'Teacher Professional Development'. Report of a Peer Learning Activity in Naas, Ireland, 2– 6 October 2011. Brussels: Directorate-General for Education and Culture.

Healey, M. (2008). Linking research and teaching to benefit student learning: research context, developments and future directions. *Journal of Geography in Higher Education* 32(2), 163–166.

Hargreaves, A. (1994). *Changing teachers, changing times. Teachers' work and culture in the postmodern age.* Great Britain: Teachers College Press.

Hargreaves, D.H. (2000). *The production, mediation and use of professional knowledge among teachers and doctors: a comparative analysis*. In Knowledge Management in the Learning Society (pp. 219–236). Paris: OECD/CERI.

Issitt, M. and Spence. J. (2005). Practitioner Knowledge and Evidence-Based Research. Policy and Practice. *Youth & Policy* 88, 63–82.

Kansanen, P. (2003). *Teacher education in Finland: current models and new developments*. In M. Moon. L. Vlãsceanu & C. Barrows (Eds.), Institutional approaches to teacher education within higher education in Europe: current models and new developments (pp. 85–108), Bucharest: Unesco-Cepes.

Laukkanen. R. (2006). *Finnish Strategy for High-level Education for All. Paper presented at the conference Educational Systems and the Challenge of Improving Results*. University of Lausanne. Lausanne. Switzerland. 15–16 September 2006.

Memorandum (2005). *Common European Principles for Teacher Competences and Qualifications.* The memorandum of the expert group in the field of teacher education (Prof. Sonia Blanford, UK; Prof. Bernard Cornu, France; Prof. Hannele Niemi, Finland; and Prof. Pavel Zgaga, Slovenia). Brussels: Directorate-General for Education and Culture.

National Advisory Board on Research Ethics (2009). Ethical principles of research in the humanities and social and behavioural sciences and proposals for ethical review. Helsinki. Retrieved from http://www.tenk.fi/eettinen_ennakkoarviointi/ethicalprinciples.pdf

Niemi, H. (2010). Teachers as high level professionals – What does it mean in teacher education? Perspectives from the Finnish teacher education. In K.G. Karras & C.C. Wolhuter (Eds.), *International handbook of teacher education world-wide issues and challenges* (Volume l & ll, pp. 237–254). Athens –Atrapos, Greece.

Niemi, H. (2002). Active Learning – A cultural change needed in teacher education and in schools. *Teaching and Teacher Education* 18 (8), 763-780.

Niemi, H. and Jakku-Sihvonen, R. (2006) Research-based teacher education. In R. Jakku-Sihvonen & H. Niemi (Eds.), *Research-based teacher education in Finland – reflections by Finnish teacher educators* (pp. 31–50). Turku: Finnish Educational Research Association.

Niemi, H. and Jakku-Sihvonen, R. (2011). Teacher Education in Finland. In M. Valenčič Zuljan & J. Vogrinc (Eds.), *European Dimensions of Teacher Education. Similarities and Differences* (pp. 33–51). Slovenia: University of Ljubljana & The National School of Leadership in Education.

Niemi, H. and Kohonen, V. (1995). *Towards new professionalism and active learning in teacher development: Empirical findings on teacher education and induction*. University of Tampere. Department of Teacher Education. Research series A 2.

Nonaka. I. and Toyama, R. (2003). *The Knowledge-Creating Theory Revisited: knowledge creation*. OECD Publishing. Retrieved from www.oecd.org/edu/socialoutcomes/cohesion.

Oser, Fritz K. (1994). Moral Perspectives on Teaching. In L. Darling-Hammond (Ed.), *Review of Research in Education 20* (pp. 57–127). Washington. DC: AERA.

Ozga, J. (2000). *Policy Research in educational settings. Contested terrain.* Buckingham: Open University Press.

Pintrich, P.R. and McKeachie, W.J. (2000). A Framework for Conceptualizing Student Motivation and Selfregulated Learning in the College Classroom. In P.R. Pintrich & P. Ruohotie (Eds.), *Conative Constructions* (pp. 31–50). University of Tampere, Research Centre for Vocational Education.

Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. In B. Smith (Ed.), *Liberal education in a knowledge society* (pp. 67–98). Chicago: Open Court.

Scardamalia, M. and Bereiter, C. (2003). Knowledge building**.** In *Encyclopedia of Education* (2nd ed., pp. 1370–1373). New York: Macmillan Reference. USA.

Schön, D. A. (1991). *The reflective turn: Case studies in and on educational practice*. New York: Teachers Press. Columbia University.

Schuller, T. (2006). International policy research: 'evidence' from CERI/OECD. In J. Ozga, T. Seddon, & T. Popkewitz (Eds.) *Education Research and Policy* (pp.78–90). London: Routledge.

Sebba. J. (2004). Developing an evidence-based approach to policy and practice in education. In G. Thomas and R. Prong (Eds*.)*, *Evidence Based Practice in Education* (pp. 34–43). Maidenhead: OUP/McGraw-Hill.

Sfard, A. (1998). On Two Metaphors for Learning and the Dangers of Choosing Just One. *Educational Researcher*, 27 (2), 4-13.

Simola, H. (2005) The Finnish Miracle of PISA: Historical and Sociological Remarks on Teaching and Teacher Education. *Comparative Education*, 41 (4), 455-470.

Smyth, J. (1995) Introduction. In J. Smyth (Ed.) *Critical discourses on teacher development* (pp. 1–19). Great Britain: Cassell. Wellington House.

Tabachnick, B. R. and Zeichner. K. M. (1991). Reflections on reflective teaching. In B.R. Tabachnick & K.M. Zeichner (Eds*.)*, *Issues and practices in inquiry oriented teacher education* (pp. 1–20). New York: Falmer Press.

Välijärvi, J. (2004). The System and How Does it Work – some Curricular and Pedagogical Characteristics of the Finnish Comprehensive Schools. *Educational Journal* (The Chinese University of Hong Kong), 31 (2) & 32 (1), 31-55.

*Correspondence:*

*Prof. Hannele Niemi*
*Faculty of Behavioural Sciences*
*P.O. Box 9 (Siltavuorenpenger 5 A)*
*FI-00014 University of Helsinki*
*Finland*
*E-mail: hannele.niemi@helsinki.fi*