Miracle of Education

The Principles and Practices of Teaching and Learning in Finnish Schools

Hannele Niemi, Auli Toom and Arto Kallioniemi (Eds.)

SensePublishers

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Edited by

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SENSE PUBLISHERS
ROTTERDAM/BOSTON/TAIPEI

A C.I.P. record for this book is available from the Library of Congress.

ISBN: 978-94-6091-809-4 (paperback)
ISBN: 978-94-6091-810-0 (hardback)
ISBN: 978-94-6091-811-7 (e-book)

Published by: Sense Publishers,
P.O. Box 21858,
3001 AW Rotterdam,
The Netherlands
www.sensepublishers.com

Printed on acid-free paper

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ACKNOWLEDGEMENTS

We would kindly like to thank the following collaborators and partners, who have supported the process of this book.

Faculty of Behavioural Sciences, University of Helsinki, for financial support and for the collegial scholarly community where this book has taken its shape.

Department of Teacher Education, University of Helsinki, for financial support and for creating an encouraging environment and functional infrastructure for research-based teacher education.

CICERO Learning Network, University of Helsinki, for providing financial support and an inspirational forum for research cooperation.

Ministry of Education and Culture, Finland, for giving support and space for the development of research-based teacher education in Finnish universities.

The Finnish National Board of Education for excellent cooperation and for providing important support for researchers in the development of teaching and learning in Finnish schools.

Mr. Tuomo Aalto, Faculty of Behavioural Sciences, who has offered his expertise and skills for the finalization and technical editing of the book.

Sense Publishers, Rotterdam/Taipei/Boston, who have offered a prestigious forum to publish the book, supported us continuously during the project and finally made the publication of the book possible.

All teachers, teacher educators and students in schools who have given their time and commitment in several educational research and development projects in Finland.

ARMI MIKKOLA

PREFACE:

Perspectives for the Future of the Teaching Profession

The welfare of Finnish society is based on knowledge and competence. Ensuring and improving citizens' knowledge bases and capacity building require equal possibilities for everyone to receive quality education. All students have a right to good education and counselling irrespective of the region they come from and its local conditions. Access to further education and continuing studies after comprehensive education and employability cannot be endangered because of a poor quality of primary and secondary education. Therefore, the teaching staff in all local educational institutions should be qualified and competent.

The requirements of teacher qualification are based on four different sub-areas: content knowledge, expertise in learning and teaching, social and moral competences, and the many-sided skills involved in practical school work. These sub-areas are not separated, and they are linked to each other in many different ways. Supporting this integration is one of main challenges of teacher education. It also requires a continuum of teachers' basic and in-service education.

Teachers have to be many-sided experts in their fields. They must have a wide view of every aspect of education and schooling. Teachers need content knowledge and the pedagogical knowledge integrated with it. Furthermore, they must be ready to make long-range plans for education, and not limit their work only to the development of specific aspects of these plans. An understanding of the wholeness of education and schooling is important for developing curricula. Teachers should also have an idea about the networks of different experts who are involved in creating and developing content knowledge. Nowadays, there seems to be some debate over what the common concept of the purpose schools should involve. The concept of schools having a function is being revisited in a dialogue between different points of view. Schools should simultaneously transmit traditional knowledge and skills and direct students to use new knowledge environments in a creative way. In society there are very different and contradictory opinions about what should be the main contents and methods of teaching. Schools, as communities, should set aims for their own work, develop working methods and create tools and procedures for evaluating their effectiveness. Schools cannot be directed by some random trends or strident demands. Reforms must be implemented through dialogue and discussions with partners in society. In the future, the teaching profession and teachers need a readiness to participate and

contribute to debates concerning the role of schools in society. (Niemi 2005; Välijärvi 2006).

As the traditional concepts of knowledge of learning have broadened, educational institutions and teacher are facing new challenges. They have to teach students how to learn and regulate their learning in addition to teaching knowledge and skills. Changes in working life require continuous learning and education. As the experts in a knowledge-related profession, teachers are required to act as a model of life-long learning. The core area of teaching profession is the expertise of learning and teaching. In the future teachers will have to use this expertise flexibly not only over different stages of educational organizations, but also over different age groups and different districts. Teachers use their knowledge of teaching and learning in different situations as they work with different people. Networks are also a vital part of a teacher's work. One of the main tasks of a teacher is to determine how relationships with new learning environments should be moulded in such a way that they support the harmonious development of students (Niemi, 2005; Välijärvi, 2006).

Teachers' work includes important societal and cultural values in society. Democracy, the value of a human being, active citizenship and human welfare are important objectives, which should be at the centre of every day life in schools. If the goal of school education is an open and reflective student with skills for co-operation, it is important to explore what kinds of education and school environments facilitate these goals. Students can be expected to be remarkably more sophisticated and competent than the way they are modelled in schools' daily working practices. The ethical and social dimensions of the teaching profession are becoming even more important with the changes in economical wellbeing and social problems in society. Schools cannot solve the problems that arise from the breakdown of social networks in society by themselves, therefore teachers are expected to work more in co-operation with other specialists. As students should be provided with the most appropriate help with their problems, the meaning of the co-operation between schools and parents is becoming more and more important.

According to international comparisons, Finnish teachers are well placed to influence their work. Decentralized decision making and local responsibility for local curricula have been characteristics of our educational policy since the 1980's. This means that teacher's work needs many kinds of practical wisdom as well as leadership knowledge. Questions about school life, teachers and students rights and obligations and furthermore, questions about school economics and management are examples of matters that are part of a teacher's expertise. Student teachers are familiarized with these kinds of question already in their teacher education especially during their teacher practice periods. (Välijärvi, 2006)

Evaluations have uncovered that Finnish teacher education is able to give student teachers a good command of content knowledge together with many-sided expertise in teaching and learning. Periods of teaching practice, which are an integral part of teacher education, give the student teachers the competences they

will need in school life. One main challenge for the future is putting more emphasis on societal issues and their dimensions in teacher education. Ethical and social matters are becoming more and more significant parts of teachers' expertise. This should also be a vital part of the contents and practice in teacher education.

Even with these problems, the status of Finnish teacher education is still better than in many other countries, if we look at our situation from an international perspective. The universities can choose the best candidates from the pools of applicants, because young people are interested in teacher education. Every year there are many more applicants than the universities can take to begin studies in teacher education. Keeping this interest in teacher education and teaching alive will be one of the main challenges for the teaching profession in Finland in the future.

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PART I INTRODUCTION:

CURRENT EDUCATIONAL FRAMING FACTORS AND CONDITIONS IN FINLAND

PASI REINIKAINEN

1. AMAZING PISA RESULTS IN FINNISH COMPREHENSIVE SCHOOLS

ABSTRACT

This chapter highlights Finnish students' outstanding success in PISA studies during the last decade. This success has been a great joy to educational practitioners and decision makers in Finland. It has been amazing how the Finnish education system, with only average monetary investments, a very small amount of homework and lesson hours and extremely light education evaluation (no inspection system) can reach such results high quality and equality in international comparisons. The purpose of this chapter is to present the Finnish students' PISA results and describe the special characteristics and strengths of our comprehensive schools. In fact, there is no one single explanation for the result. Rather, the successful performance of Finnish students seems to be attributable to a web of interrelated factors having to do with comprehensive pedagogy, students' own interests and leisure activities, the structure of the education system, teacher education, school practices and Finnish culture.
Keywords: PISA, learning outcomes, Finland

PISA STUDY

Through the PISA studies the OECD aims to achieve its educational policy strategic objectives. Firstly, it evaluates and improves the outcomes of education by evaluating the trends in learning outcomes of schooling and analysing and improving policies and practices. Secondly, it promotes quality teaching by developing indicators for teaching and learning. Thirdly it builds social cohesion through education by improving outcomes for students with special needs and responding effectively to ethnic and cultural diversity.

PISA focuses on young people's ability to use their knowledge and skills to meet real-life challenges. This orientation reflects a change in the goals and objectives of curricula themselves, which are increasingly concerned with what students can do with what they have learned at school and not merely with whether they have mastered specific curricular content. PISA 2009 is the fourth of triennial surveys in the OECD's assessment programme that since 2000 aims to study students' learning outcomes in reading literacy, mathematical literacy and scientific literacy. Each PISA cycle is named according to the year in which the assessment takes place. The main focus of PISA 2000 was on reading literacy,

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 3–18.
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in the sense that it included an extensive set of tasks in this domain. In PISA 2003 the emphasis was on mathematical literacy and an additional domain on problem solving was introduced. In 2006 the focus was on scientific literacy. The assessment of the main area is extensive and receives most of the testing time while in the minor assessment areas only the general trend of learning outcomes can be studied. Thus, in PISA 2009 it was possible for the first time to reliably study the changes in students' performance in reading literacy over a 9-year period.

In PISA 2009 (and the second round in 2010), a paper- and- pencil assessment was completed by approximately 520,000 students, representing the 28 million 15-year-old students in 74 participating countries and economies covering 87% of world economies.

In Finland, data was gathered from 6415 students in 203 schools. All the Swedish speaking schools in Finland were sampled in order to make reliable comparisons between the two language groups in Finland.

HIGH LEVEL OF PISA RESULTS

Finnish Students among Top-achievers in PISA

Finnish students' performance has been among the best in all the domains in each PISA cycle; although the number of participating countries and economies has increased over the years from 34 to 74.

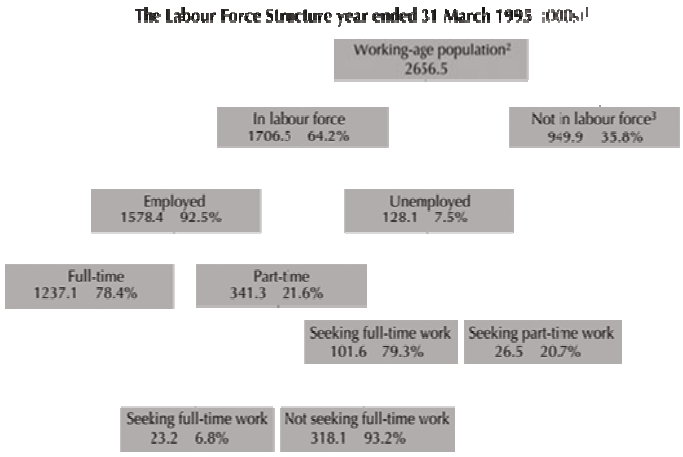
Reading Literacy

In PISA, reading literacy is defined as understanding, using and reflecting on, and engaging in written texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society. A wide selection of authentic texts and tasks that the reader will encounter in everyday life has also been included in the test. In Figure 1, one of the reading items with two following questions is introduced.

Reading Results

In PISA 2009, the OECD countries of Finland and Korea and the partner economies of Hong Kong, China and Shanghai, China had mean reading scores well above any other participants (see Figure 2). It is notable that besides Finland, all top-performing countries and partner economies represent either Asian countries or English-speaking OECD countries. Furthermore Finland clearly

The tree diagram below shows the structure of a country's labour force or "working-age population". The total population of the country in 1995 was about 3.4 million.



1. Numbers of people are given in thousands (000s).
2. The working-age population is defined as people between the ages of 15 and 65.
3. People "Not in labour force" are those not actively seeking work and/or not available for work.

Source: D. Miller, Form 6 Economics, ISA Publications, Box 9963, Newmarket, Auckland, New Zealand, p. 64.

Use the information about a country's labour force shown above to answer the questions below.

QUESTION 4.1

What are the two main groups into which the working-age population is divided?

A. Employed and unemployed.

B. Of working age and not of working age.

C. Full-time workers and part-time workers.

D. In the labour force and not in the labour force.

QUESTION 4.2

How many people of working age were not in the labour force? (Write the *number* of people, not the percentage.)

Figure 1. A sample question for OECD's PISA reading literacy. Source: (OECD, 2009b)

outperformed the other Nordic countries as well as all the other European countries: the second best European country in the PISA 2009 reading literacy assessment was the Netherlands (10th in the country comparison). Finnish students' reading literacy performance is still characterized by a high level of equity, since the gap between the low and top performers in Finland was clearly narrower than the average within the OECD. However, the distribution of performance was even narrower in Shanghai, Korea, and Hong Kong. The four top countries and economies all show that both quality and equity of learning outcomes can be attained in very different educational and linguistic contexts.

Mathematical Literacy

PISA's definition for mathematical literacy is the following: An individual's capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen. An example of a PISA mathematics item is shown in Figure 3.

Mathematics Results

During the last rounds of PISA studies, students from East Asian countries dominated in mathematical literacy. The only high-performing country outside of the East Asian region was Finland. In PISA 2009 students in Shanghai, China are by far the best performers in mathematics with a mean score of 600 points (see Figure 2). Their mean score is 59 points higher than the Finns', who still rank as the OECD's best students.

On average across OECD countries, nearly four in five students (78%) are proficient in mathematics to the level where they can use basic mathematical algorithms, formulae, procedures, or conventions, and can reason mathematically. In Finland and Korea, and in the partner countries (which are not members of OECD) Hong Kong, Liechtenstein, Shanghai, China and Singapore, over 90% of students reach that level. At the other end of the scale, one in eight students (13%) on average in OECD countries are so-called top performers, capable of complex mathematical tasks requiring broad, well-developed thinking and reasoning skills. In Shanghai, China, over 50% of students reach that level. Respectively, in Korea the percentage of these students is 26%, and in Finland 22%.

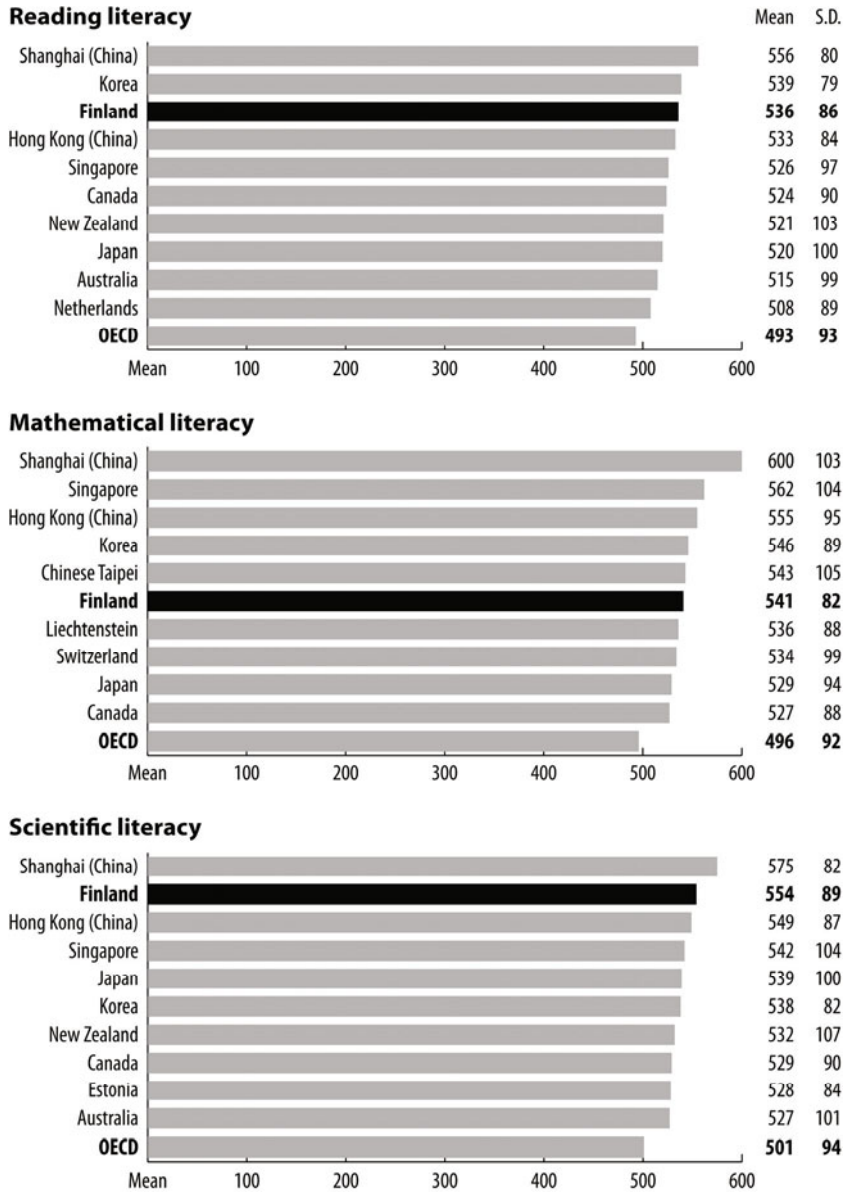


Figure 2. Top countries' performances in reading, mathematical and scientific literacy, PISA 2009.

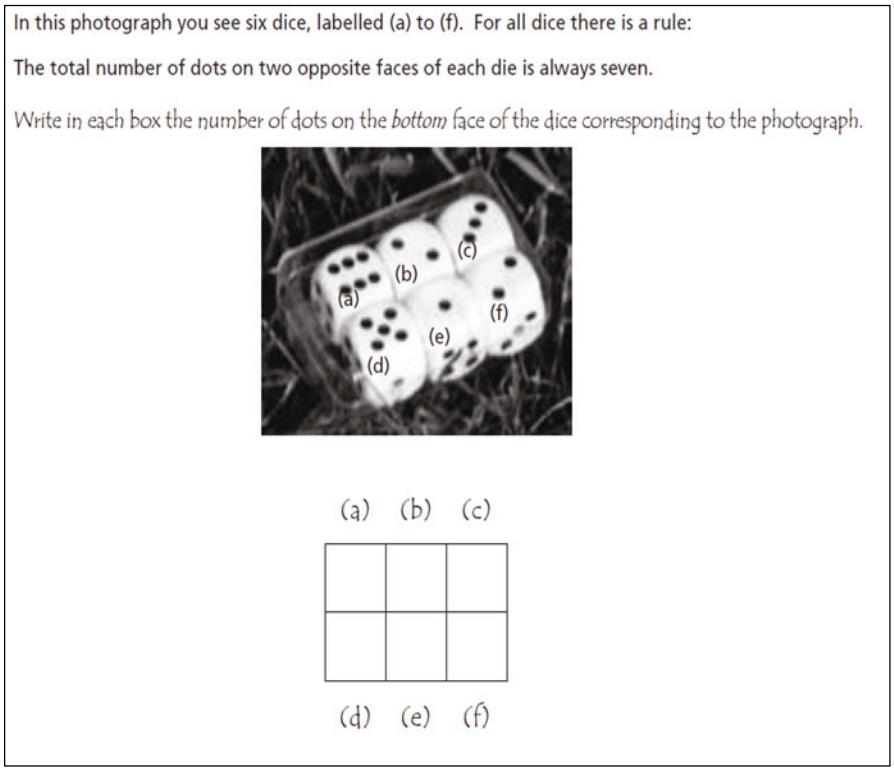


Figure 3. A sample question for OECD's PISA mathematical literacy. Source: (OECD, 2009b).

Scientific Literacy

The PISA 2009 framework gave the following definition for scientific literacy: An individual's scientific knowledge and use of that knowledge to identify questions, to acquire new knowledge, to explain scientific phenomena, and to draw evidence based conclusions about science-related issues, understanding of the characteristic features of science as a form of human knowledge and enquiry, awareness of how science and technology shape our material, intellectual, and cultural environments, and willingness to engage in science-related issues, and with the ideas of science, as a reflective citizen.

Read the following information and answer the questions that follow.

Daylight on 22 June 2002

Today, as the Northern Hemisphere celebrates its longest day, Australians will experience their shortest. In Melbourne*, Australia, the Sun will rise at 7:36 am and set at 5:08 pm, giving nine hours and 32 minutes of daylight.

Compare today to the year's longest day in the Southern Hemisphere, expected on 22 December, when the Sun will rise at 5:55 am and set at 8:42 pm, giving 14 hours and 47 minutes of daylight.

The President of the Astronomical Society, Mr Perry Vlahos, said the existence of changing seasons in the Northern and Southern Hemispheres was linked to the Earth's 23-degree tilt.

*Melbourne is a city in Australia at a latitude of about 38 degrees South of the equator.

Source: The Age newspaper, Melbourne, Australia, 22nd June 1998 (adapted).

QUESTION 3.1

Which statement explains why daylight and darkness occur on Earth?

A. The Earth rotates on its axis.

B. The Sun rotates on its axis.

C. The Earth's axis is tilted.

D. The Earth revolves around the Sun.

QUESTION 3.2

In the Figure light rays from the Sun are shown shining on the Earth

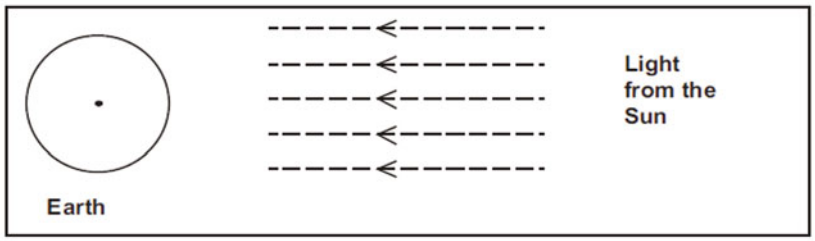


Figure: light rays from Sun

Suppose it is the shortest day in Melbourne.

Show the Earth's axis, the Northern Hemisphere, the Southern Hemisphere and the Equator on the Figure. Label all parts of your answer.

Figure 4. A sample question for OECD's PISA scientific literacy. Source: (OECD, 2009).

Science Results

In science, Finland has been among the highest achieving countries in every PISA study. However, in PISA 2009 it was Shanghai's turn to score highest (see Figure 2). In this most recent PISA, Finland and Hong Kong, China share second place; although Finland is the highest scoring OECD country with the most top (19%) and least low performing 6% students in science. In the OECD on average, the corresponding figures were 9% and 18%.

ABOUT PISA ITEMS

As can be seen from the PISA sample items (Figures 1, 3 and 4), each one of cognitive questions is arranged in units based around a common stimulus. Many different types of stimuli were used (passages of text, tables, graphs and diagrams, often in combination). The total number of cognitive items in PISA is well over 100 representing around 2 hours of testing time. Item formats employed with science cognitive items were multiple-choice, short closed-constructed response, and open- (extended) constructed response. (OECD, 2009c)

In PISA score points were scaled so that the mean of OECD countries was 500 and the standard deviation was 100.When a closer look is taken at students score points in reading, mathematical and scientific literacy, strong correlations can be observed between these different literacies. The correlation between the students score points in reading and mathematics in Finland is 0.78, between reading and science 0.87 and between mathematics and science 0.85. The results can partly be explained by the nature of the items in PISA, which all are in one way or other problem solving items. To be able to respond to science or maths items students are required to read and understand texts. Thus a weaker reader is likely to get weaker results also in maths and science.

Interest in Reading and Reading Strategies Important

PISA shows that in Finland, students' high reading literacy performance is related to several interrelated factors: namely, to their attitudes towards reading, their command of effective and appropriate reading strategies, and also the diversity of reading materials. All of these explanatory factors of reading literacy are more pronounced in Finland than in the OECD on average. (Sulkunen et al., 2010)

Trends in Performance of Finnish Students

The reading literacy proficiency of Finnish students in the PISA 2009 assessment has decreased by 10 points during the last 9 years since PISA 2000 (Figure 5). A similar comparison of scientific literacy results with the "science" PISA 2006

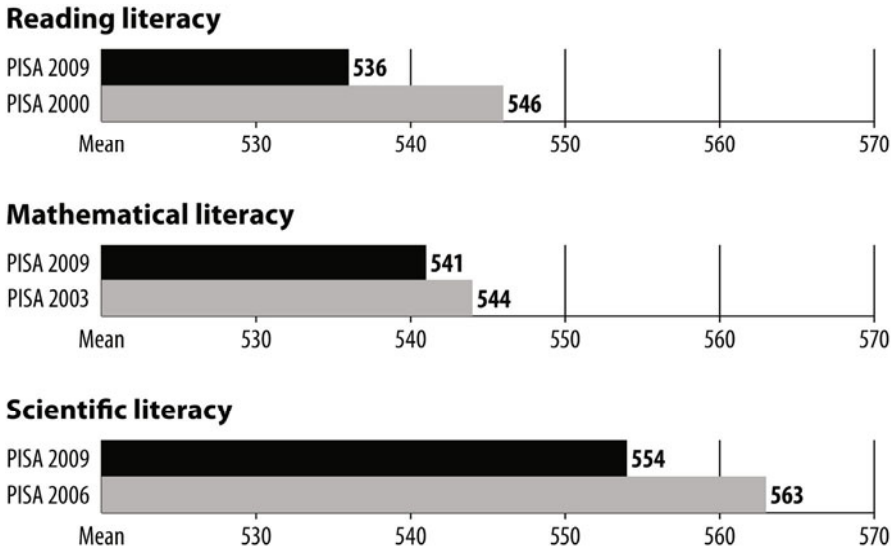


Figure 5. Trends in reading, mathematics and science

results also shows a slight but significant decrease. However, students' recent performance results in mathematical literacy have remained at approximately the same level when compared with the results of the "mathematics" PISA in 2003. Although these observed decreases are small and barely significant, it is a trend that causes concern.

It is very difficult to find reasonable explanations for the slight decreases observed in reading and science literacy since the first PISA results were published in Finland in 2001. The national distribution of lesson hours was altered at that time to increase instructional time for mother tongue and literature, science, and mathematics in every grade of comprehensive school. Since the overall instructional time stayed the same, these extra hours were mostly taken away from arts, crafts and physical education lessons; so it seems that it is not the quantity, but the quality of lessons which matters.

A closer comparison between the Finnish results of same items (link items) used in PISA (2000 and 2009 in reading literacy, of PISA 2003 and 2009 in mathematical literacy and PISA 2006 and 2009 in science) also gives somewhat puzzling results. Instead of a slight overall decrease in the percentage of correct answers we can observe no differences in most of the items, but there is a 20% difference in some single items. This makes us wonder how notable these most recently observed statistically significant differences in trends actually are.

EQUAL OPPORTUNITIES TO LEARN

Between School Equality

In every PISA study in Finland, differences between schools in students' reading, mathematics and science scores have been exceptionally small, normally less than 8% of the total variance in student scores: although in recent years, there seems to be a slight increase of a few percentage points in the differences between schools. These small between-school differences indicate great equity in Finnish comprehensive school - the school choice has only a minimal impact on students' achievement. The main reason for this is that almost 95% of Finnish PISA-aged students are still in comprehensive school with no tracking of streaming and with a high quality of both teachers and instructional material. Regional differences as well as differences between urban and rural areas are also very small.

Equality Related to Family Background

The PISA results show that a student's socio-economic background, measured as economic, social and cultural capital of the home, is associated with his or her reading performance to some extent in all participating countries. On average across the OECD countries, 14% of variation in students' reading performance can be explained by their socio-economic backgrounds. However, Finland (with a corresponding figure 7.8%), together with three others of the highest performers in PISA 2009, Shanghai (12.3%), Korea (11.0%), and Hong Kong (4.5%) has succeeded in promoting equality by reducing the extent to which a student's socio-economic background affects his or her performance in school. On the other hand, in the OECD countries of Hungary (26.0%), Belgium (19.3%), Turkey (19.0%), and Chile (18.7%) family background is a stronger factor in learning outcomes.

There has been a significant widening of the performance gap between students from different backgrounds from 2000 by 2009 in Finland. Even still, it remains well below that of the other OECD countries. It should also be kept in mind, that although socioeconomically advantaged students tend to perform better on average, a number of them still perform poorly, just as a number of disadvantaged students perform well (OECD 2010b).

CHALLENGES TO EDUCATIONAL EQUALITY

Gender Difference

In every one of the 65 countries and economies that participated in PISA 2009, girls scored significantly higher in mean reading performance than boys. This gender gap in reading varies from less than 25 points in 7 countries to more than 50 points in 14 countries and economies. In Finland the gender gap in reading

is 55 points favouring girls, which is the most pronounced difference of all OECD countries. Boys are overrepresented among weak readers and girls among top readers. In Finland there are about four times as many boys among the weak readers (13%) as girls (3%) and among the top readers the respective percentages are 9% of boys and 21% of girls.

The lower reading proficiency among the Finnish boys has not become a major equity issue or concern in the Finnish education system, although it is the equivalent of 1.4 years of schooling. One reason for this is that the Finnish boys still score very high: about 15 points above the OECD average, and are still among the best boy readers in PISA. However, closing the gender gap could be one of the easiest ways to improve reading performance overall. It also means that girls have a clear head start over boys for their future studies and working life as far as reading skills are concerned. This can already be seen in university graduate rates in Finland where 62% of graduates are females and 38% males (OECD, EAG 2009).

Boys outperform girls in mathematics in 35 of the 65 countries and economies that participated in PISA 2009 and by an average of 12 points across OECD countries. However, in Finland there are no significant gender differences. Thus it seems that in Finland, students' mathematics skills are not gender dependent.

In science, girls outperform boys in 21 of the 65 countries and economies that participated in PISA 2009. This was also the case in Finland, where the gender gap was quite large - 15 points favouring the girls. However, on average across OECD countries, boys and girls achieve the same scores, suggesting that science is a domain where policies that focus on gender equality have been most successful.

Difference between the Language Groups

There are two national languages in Finland, Finnish and Swedish. In PISA 2009 as well as in earlier PISAs, Finnish-speaking students clearly outperformed their Swedish-speaking peers. The observed gap between language groups is 27 points in reading, 14 points in mathematics, and 28 in science. In reading and science these differences amount to more than half a school year's progress. However, when compared internationally, it is notable that Swedish-speaking Finns still do quite well, and clearly better than students in Sweden who also speak Swedish as their mother language.

Immigrant Education

The very small proportion of immigrant population in Finland is commonly considered to be one of the reasons for Finnish success in PISA studies. According to PISA 2009 results in Finland, there is a pronounced performance difference between native students and students with an immigrant background. Even after

accounting for socio-economic background, students with an immigrant background score, on average, 69 points below students without an immigrant background in reading: this difference in reading performance is the equivalent of 1.8 years of formal schooling. This is the second biggest difference between immigrants and non-immigrants among OECD countries after Mexico (128 points); the OECD's average being 35 points respectively. In Israel, Australia, the USA, and Canada students from an immigrant background perform just as well as their non-immigrant peers (OECD, 2010b). These PISA findings call for active educational policy making that aims at more effective integration training for immigrants in Finland.

EFFECTIVE EDUCATION SYSTEM

High Performance with Average Investment

The mean score summarises the performance of students overall and shows that reading standards vary greatly among countries and economies in ways that cannot simply be attributed to the countries' different stages of economic development. A nation's wealth and expenditure on education influences educational success; but GDP per capita accounts for only 6% of the differences between countries' average student performance. The other 94% reflects the fact that two countries of similar prosperity can produce very different educational results (OECD, 2010a). For example Figure 6 shows, the public spending per student up to age 15 on the horizontal axis and the performance at the vertical axis. We can see that the cumulative expenditure on the education of a 15-year-old in Finland represents international average and is at the same level as in Germany. However, the difference between these two nations in mean performance scores on the PISA science scale is about 40 points favouring Finland (see Figure 6) (OECD, EAG 2009).

High Results with Minimum Instruction Hours

Instruction time in formal classroom settings accounts for a large portion of the public investment in student learning and is considered to be a central component of effective schooling. The amount of schooling determines students' opportunities to learn. Instruction time is also regarded as one of the main factors in schools' operations. In Finland, school for children starts at the age of 7. Among OECD countries, compulsory instructional time between the ages of 7 and 14 is 6777 hours. However, as can be seen in Figure 7, this instructional time in Finland is 1025 hours less, being only 5752, which is among the lowest ones in the OECD countries. In Finland the students are expected to receive, on average 1216 hours between the ages of 7 and 8, 2049 between the ages of 9 and 11, and 2487 hours between the ages of 12 and 14. The corresponding mean hours in the OECD are

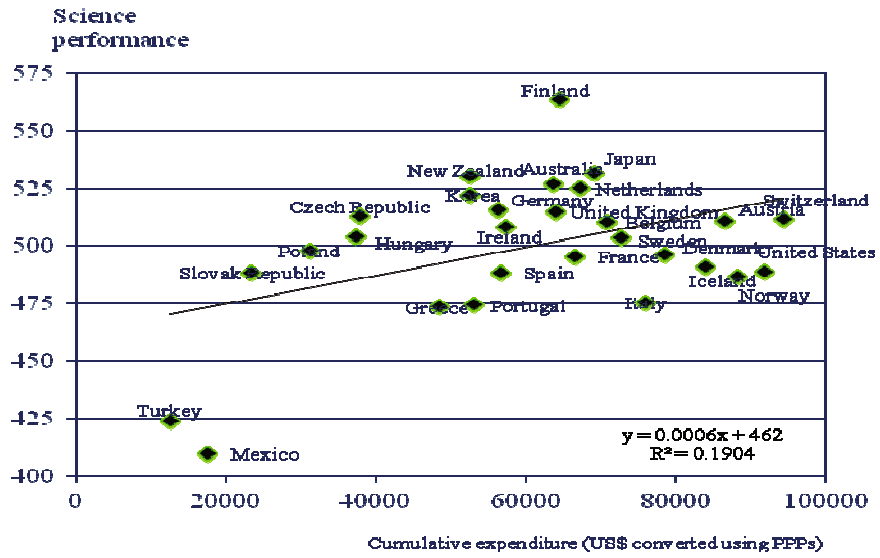


Figure 6. Pisa achievement versus cumulative expenditure on education (PISA 2006)

1554, 2466 and 2754. It is really amazing, how Finnish students can achieve the topmost results with the minimum instructional time. There seems to be a question of the quality of education, not about the quantity. (OECD EAG 2010)

Small Class Sizes

Class size and student teacher ratios are hotly debated topics in Finnish education policy discussions - along with students' total instruction time. The average class size in primary and lower secondary education varies from about 30 or more in Japan and Korea to 20 or fewer in Denmark, Finland, Iceland, Luxembourg and Switzerland. In two-thirds of the countries with comparable data for 2000 and 2008, class sizes have tended to decrease. However, in Finland those have stayed the same at 20.1 students.

In OECD countries the ratio of students to teaching staff in primary education ranges from 24 or more per teacher in Chile, Korea, Mexico and Turkey, to fewer than 11 in Hungary, Italy, Norway and Poland. The OECD average is 16 students

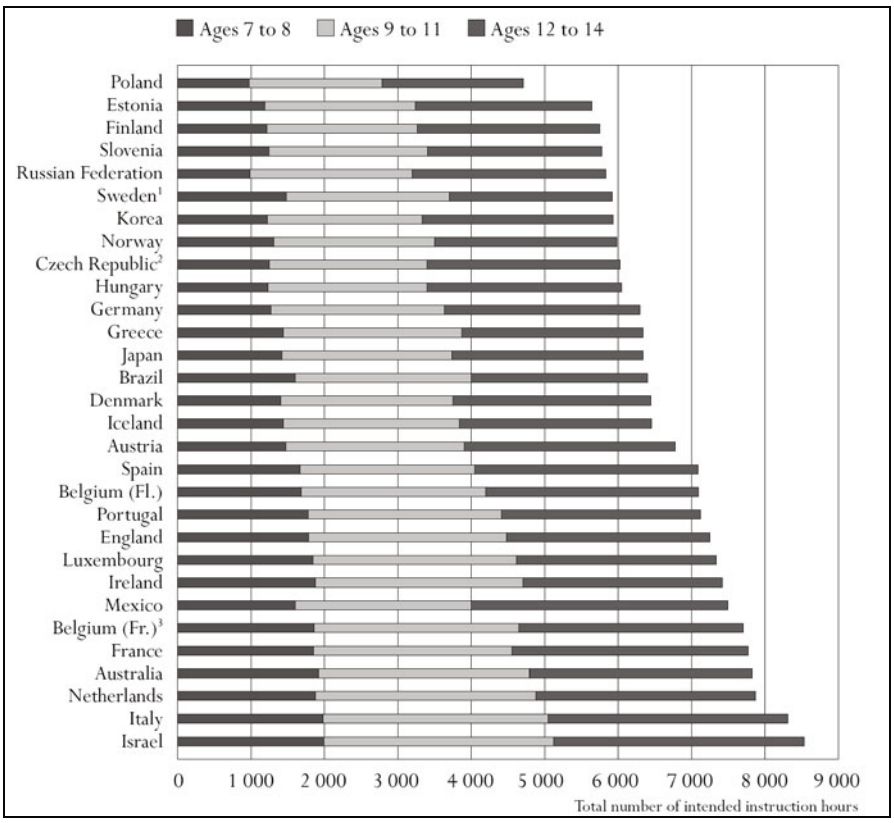


Figure 7. Total number of intended instruction hours in public institutions between the ages of 7 and 14 (2007) (Source: Education at a Glance 2010, Chart D1.1)

per teacher. In Finland this figure is 11.4, well beyond the OECD average. In lower secondary education the OECD average is 13.7 and in Finland 10.6 students per teaching staff. (EAG 2010)

SUMMARY

The outstanding Finnish students' performance in PISA cannot be explained only by school related factors. As Sadler already in 1900 stated, "In studying foreign systems of education, we should not forget that the things outside the schools matter even more than the things inside the schools and govern and interpret the things inside" (Sadler, 1979). So in order to understand these high quality educational outcomes we have to look as well for the specific social, cultural, economical and historical characteristics of Finland.

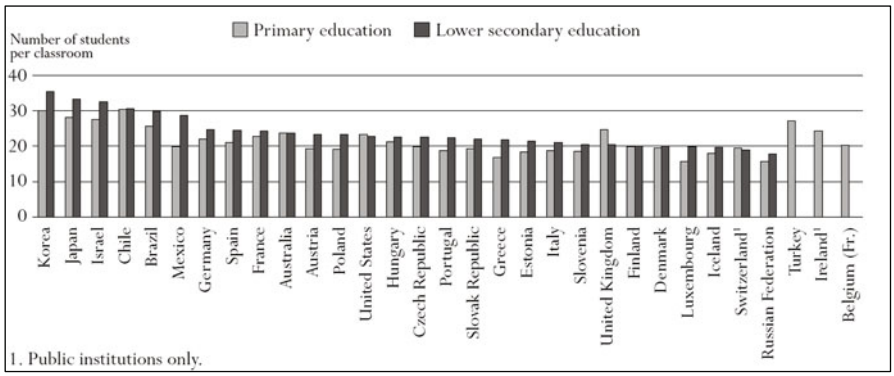


Figure 8. Average class size in educational institutions, by level of education (2008) (Source: EAG 2010 Chart D2.2)

One way to approach these characteristics is to take a closer look at comparative statistics. As an example, Newsweek (2010) ranked Finland as a best country in the world using factors related to health, economic dynamism (the openness of a country's economy and the breadth of its corporate sector), education, political environment, and quality of life. Another, so-called Legatum Institute's Prosperity Index (2010) ranking of 110 countries covering 90% of the World's population ranked Finland also among the happiest countries. The prosperity index was constructed from the fields of economy, entrepreneurship & opportunity, governance, education, health, safety & security, personal freedom and social capital. Finland has also been chosen as the greenest countries – the most liveable place on the earth by the Reader's Digest (2008).

The well being of Finnish children (UNICEF, 2007; OECD, 2009d) has also ranked to be among the top countries in the world. In these comparisons material well-being, housing and environment, educational wellbeing and health and safety in Finland were ranked very high.

These different rankings reveal that it is somewhat evident that Finnish students' amazing results in PISA, good living conditions and children's wellbeing form a cycle in which these components can either reinforce or diminish each other.

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2. THE SOCIETAL FACTORS CONTRIBUTING TO EDUCATION AND SCHOOLING IN FINLAND

ABSTRACT

The article introduces the reasons why teaching and learning have a high priority in Finnish society and how teacher education support teachers' role to work as high quality professionals. The article provides a brief review of the historical and cultural movements that have had an influence on respect for education and learning in Finnish society. The article also provides a description of the Finnish educational system with the comprehensive school as one of its important element. The major reasons for the success of Finnish education are a combination of political will, purposeful efforts to promote equity by the educational system, high quality teacher education, teachers' professional and moral responsibility, and society's trust in the educational actors.

Keywords: teacher education, equity, educational system, teaching profession, teachers

THE FINNISH EDUCATION: EQUITY AND QUALITY AS ITS MAIN OBJECTIVES

Introduction

The Finnish education system has received attention from all over the world because of the great success of Finnish 15-year-olds in the OECD's PISA surveys in 2000, 2003, 2006 and 2009 (*e.g.* OECD, 2006; 2009; 2010). The knowledge and skills of Finns in problem solving, scientific, mathematical and reading literacy are representative of the highest level of international standards. Only a very few Finnish students are in the lowest PISA categories. Likewise, the between schools differences of learning outcomes are small. Major reasons for these high learning outcomes are a purposeful educational policy and the high standards of teachers. According to researchers (Schleicher, 2005; Välijärvi, 2004; Simola, 2005; Laukkanen, 2006; Niemi & Jakku-Sihvonen, 2006), the Finnish educational policy has aimed at equity in education and has promoted the

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 19–38.
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common comprehensive school model. In the process, many important decisions have been made. One of those has been the decision that all teacher education including primary school teachers was raised to the MA level (5-year programs). This article gives an overview of the major drivers of this policy, why they were taken and how they have influenced educational practice and teachers' professional roles. In the beginning of the article there is a brief review of the historical and cultural movements that have influenced Finnish education. Thereafter the structure and major features of the Finnish educational system are introduced. Finally there is a description of the Finnish research-based teacher education and its major qualities.

Respect for Learning and Education in the Finnish Culture - Education of a Nation and Comprehensive Schooling for All

In Finland, the promotion of equity, learning and education is central factor in our national history, which can be seen in the framework of cultural and historical background factors. Thus, in Finland we like to think that our success in the PISA surveys has been only a side product in the development of our educational system.

A major cultural influential background factor is the Finnish national identity. Having been first a part of the Swedish realm from 1249 to 1809, then from 1809 to 1917 existing as a Grand Duchy in the Russian Empire, Finland finally became independent in 1917. From the late 19th century onwards, a strong Finnish nationalist movement, known as the Fennoman movement, grew. Milestones included the publication of what would become Finland's national epic, the Kalevala, in 1835, and the Finnish language achieving equal legal status with Swedish in 1892. The stories of the Kalevala tell about strong individuals whose power was based on mental abilities and wisdom, not on physical strength. The national movement in the 19th century was inspired and promoted by many influential university professors who apart from working in their areas of expertise also had political power. They strongly advocated the education of the nation. Especially J.V. Snellman (1806–1881), philosopher, statesman and later also Head of the Bank of Finland, stressed the value of education and learning for the nation. The main message of representatives of the Finnish national movement was the education of a nation. The power of the nation depends especially on competent leaders and quality of civil servants and teachers. Teacher education was seen as a necessary means for national education. Teacher education has had a close relationship with universities since its beginnings in the 19th century. The first teacher education seminar was established in 1863 and in 1866 the first decree for basic education was given. The most influential promoter of basic education was Uno Cygnaeus who created the main guidelines for education for all children and developed the first teacher

education models. In 1852 the first professorship in education was established at the University of Helsinki and it was closely related with teacher education and the role of education in society. It was the first professorship of education in the Scandinavian countries. The first advocates of a national identity put a strong emphasis on basic education. Respect for learning and education provided also the possibility of elevation from the lower strata of society. Historically, many teachers had peasant family backgrounds.

Respect for learning and teachers' work has long historical roots in Finland and has been a deep cultural feature in Finnish society. Teachers were considered to be important persons in local communities. They were often responsible for cultural activities in villages when a 6-year basic education became compulsory for all children in 1921. Teachers were called "candles of the nation" and very often they educated the whole village and people in local regions by organizing choirs, theatre performances and parental education in addition to their normal school work. This education process was strongly supported by the Finnish Lutheran Church that had demanded literacy as a basic requirement for obtaining permission to marry since the 15th century until the school system in society took responsibility for basic education and literacy.

Educational Policy for Equity

After the Second World War the baby boom increased the number of pupils in the 1950s. At the same time the concept of a welfare society emerged. Education was seen as a basic factor for equity in society. An important part of this process was the ideal that free education is a basic right for all citizens. At the time, there was a wide consensus between politicians that a small country has to promote equality in education by implementing a system that provides educational opportunities for as long as possible to all those are motivated to learn, regardless of their socioeconomic status, gender or residence. In those days Finland had a parallel system in education in which ten-year-old children had to decide what would be their future prospects and careers. They had to seek entrance and pass examinations into academically oriented schools or go on routes that led to vocational fields. If they selected the vocational route they could not seek entrance to higher education. The educational system put individuals into one of two categories at a very early stage of their lives, thus creating a divided nation. The academic schools very often had tuition fees, which further strengthened the divide.

Moving to a new school system that would be the same for all children was not an easy process in spite of a common general vision of the importance of education. After a very contradictory and hard political debate in the 1960s, it was decided in 1968 that the parallel school system should be replaced by a national nine-year basic education that would represent the ideology of comprehensive

education. When the Government delivered its bill to Parliament in 1967, one of the arguments for the common nine-year education for all was that it was too early to judge individual capacities after students had only had four or even six years of basic education. In the beginning of the new school streaming was allowed but it was abolished in the 1980s because of unwanted consequences. It did not increase learning outcomes but strengthened the divide between different learners. In the 1970s and 1980s the comprehensive school was a very centralized system. It was a time when a new concept of pedagogy had to be developed and teacher education was reformed radically. In the 1980s a general decentralization in all administrations was implemented in Finland and also in educational policy. It gave more freedom as well as responsibility to local educational providers. The teacher education system was also developed to provide new teachers with better competences to meet the whole age cohorts and to take more responsibility for curriculum development. During the 1980s and 1990s there were many political debates about the relevance of the common comprehensive school for all. Critical voices demanded more attention especially for gifted children. However, the comprehensive school model remained. The main policy was that the comprehensive school could have different profiles locally and support students' individual qualities without streaming or separate schools for e.g. gifted pupils.

Since the late 1960s Finnish basic education has been logically developed towards the comprehensive model, which guarantees everybody equal opportunities in education irrespective of sex, social status, ethnic group, etc., as outlined in the constitution. According to education researchers (Schleicher, 2005; Välijärvi, 2004; Simola, 2005; Laukkanen, 2006; Niemi & Jakku-Sihvonen, 2006), the educational policy has purposefully aimed at equity in education, which is the main reason for its good learning outcomes. Finland has built up an education system with the following characteristics: uniformity - free education, free school meals and special needs education. The principle of inclusion has been an important guideline. Since the 1980s, all Finnish students in basic education began to have the same goals in mathematics and foreign languages. In so doing, the Finnish Government was realistic. In reality, these goals are attained by individuals with different levels of success. However, with extra support for the weakest students, we can considerably raise the performance of the whole age group.

Laukkanen (2006) summarizes the most important decisions as: 1) the discontinuation of streaming, 2) the strong allocation of affordable educational resources to lower secondary education and 3) the decentralization of decision-making powers, 4) primary school teacher education was also raised to the MA level, 5) support for weak students was taken care of and 6) different stakeholders were invited to express their opinions.

THE STRUCTURE AND AIMS OF THE EDUCATIONAL SYSTEM

In today's Finland (population 5.4 million) education is a public service. General education, vocational education and higher education are free of charge. All political parties see the comprehensive school model as an important investment for the future and defend even free higher education, even though there is pressure to set tuition fees for higher education from some business sectors. Basic education consisting of 9 years of comprehensive school, upper secondary education and vocational education are financed by the state and local authorities. These educational services are provided by local authorities, which are municipalities or consortiums of municipalities. They have councils for strategic planning of educational issues and are responsible for the quality of education in local schools. Municipalities (local authorities) and their schools write their own curricula on the basis of the national core curriculum. Local needs can be taken into consideration in these curricula. Schools can have their own profiles such as e.g., science or music education.

Preschool education, mainly provided by social authorities in day-care centers, is offered for all 6-year-olds. It has been a subjective right for families since August 2000. Even though it is not obligatory almost the entire age cohort, about 96% of the age group, participate in preschool education. Basic education lasts for nine years. The age group contains 60,000 pupils. Children start this compulsory schooling at the age of 7. In the comprehensive schools, class teachers are mainly responsible for grades 1─6, and most of the subjects are taught by subject teachers in grades 7─9 (also called lower secondary school). In basic education, students get all their study materials and one meal for free from the school. All students living 5 km or farther from their schools have transportation to and from school arranged by their education providers. For the Swedish speaking population (about 6%) there are separate schools as well as administrative services. The aim of immigrant education is equality, working bilingualism and multiculturalism. The goals of immigrant education are to prepare immigrants for integration into the Finnish education system and society, to support their cultural identity and provide them with a functioning bilingualism so that in addition to Finnish or Swedish, they have a command of their own native language. (National Board of Education, 2003; Jakku-Sihvonen & Niemi, 2007).

Upper secondary schools usually obtain their students from many local comprehensive schools. After compulsory education at the age of 15, about half of the age group choose to go to upper secondary schools, which have academically oriented curricula and prepare students for higher education. Students who at the end of upper secondary education obtain passes in four matriculation exam subjects are awarded matriculation certificates, which provide eligibility for

universities and vocational higher education. The other half of this age group chooses a vocational school. They also have access to universities and vocational higher education. Teachers at the lower and upper secondary schools are called subject teachers. They have qualified to teach one or two academic subjects. (National Board of Education, 2003; Jakku-Sihvonen & Niemi, 2007).

The Higher education sector consists of universities and polytechnics, which now are mostly known as universities of applied sciences. The universities provide B.A., M.A. and Ph.D. degrees and have also rich variety of Open University programs and a wide provision of further education and in-service training. Polytechnics offer B.A. degrees and professionally oriented M.A. programs and also a lot of in-service training. All degree programs in higher education are free of charge, Open University programs have small registration fees and in-service training is fee based. Universities or polytechnics have entrance examinations because of the Numerus Clausus, this is a quota in each discipline that is based on negotiations between the higher education institutions and the Ministry of Culture and Education. They agree on how many degrees each institution can award over a fixed time period. Funding is not dependent on the intake of students but outcomes and productivity. The numbers of degrees are based on the anticipated needs in society. This means that not all applicants can be accepted to higher education institutions, and competition is pretty fierce.

Teacher education for teachers in comprehensive schools and upper secondary schools, as well as for those teachers who teach general subjects in adult education and vocational education, is provided at eight Finnish comprehensive universities around the country. According to old decrees issued in 1979 and 1995, and the new 2005 decree all candidates have to obtain a Masters degree to become a qualified teacher. Teachers for vocational schools must also have a MA degree.

Usually less than one forth from applicants can be accepted into universities (Kansanen, 2003; Niemi & Jakku-Sihvonen, 2011). Teacher education, especially class teacher education, is one of the most desired study programs. Because of the large numbers of applicants for class teacher education, only 10 - 15% highly motivated and talented applicants can be accepted. Also, secondary teacher education has become more and more popular in most subjects. In general, admission to the university is difficult for young people wishing to pursue a career as a subject teacher as only a small percentage of the applicants are granted admission to the faculties of their choosing. This is true particularly for biological subjects, but there have been recently problems in recruiting talented students in mathematics, physics, chemistry and some foreign languages. There have been many efforts to attract new students and this has resulted in a change from the

"elimination approach" to a "recruitment approach" in the organization of the student admission programs of the faculties. These efforts include utmost flexibility in the timing of studies and arranging entrance tests in some faculties occasionally as often as three times a year (Meisalo, 2007, p. 172). Pedagogical studies of subject teachers are normally put in the individual study plans of teacher students between the middle of subject studies e.g., during the third and fourth study years. However, it is possible to transfer from a Master's degree program at a subject faculty to pedagogical studies afterwards, by taking an entrance examination for pedagogical studies. All students applying for teacher education programs are tested and interviewed individually. (Meisalo, 2007, p. 172.)

One of the aims of the Finnish education system is to have an educational infrastructure that is devoid of so-called "dead-ends". The compulsory education is the nine years of comprehensive school, but the national aim it is to keep all children for at least 12 years in connection with the educational system and to provide after that several routes for life-long learning. The aim of the educational system is to enable an individual's education to continue. Nearly 100% of each age cohort completes the 9 years of comprehensive schooling. Ninety-four per cent of those who finish the 9th grade of comprehensive school continue their studies in the same year either in upper secondary general school or upper secondary level vocational education (Statistics Finland, 2009). The six per cent of the age cohort, who do not continue their studies, is a risk group. Municipalities have launched various programs to keep them in touch with education and learning so that they will be able to find pathways to further education. Without additional education they are in danger of being excluded from the labor market. The aims related to equity and the enablement of all people's development through learning and education set special requirements on teachers, the teaching profession and teacher studies at universities.

An inclusion policy and special needs education are extremely important in promoting all students' right to learn. The basic principle is that all students with learning difficulties must be given help and support to overcome these difficulties. They can have extra tuition hours or/and special needs instruction integrated into their own class, and temporary or more permanent help in special classes or groups. In each school there is a multi-professional student care group to which a principal, teachers as well as special need teachers, social workers, nurse belong. In 2011 a new decree was passed. According to it every teacher is responsible to identity students' learning difficulties at the earliest stage possible (National Board of Education). This widens teachers' and local level responsibility to seek solutions for supporting these students. Inclusion has been the main principle in the last decade and this new law strengthens this trend.

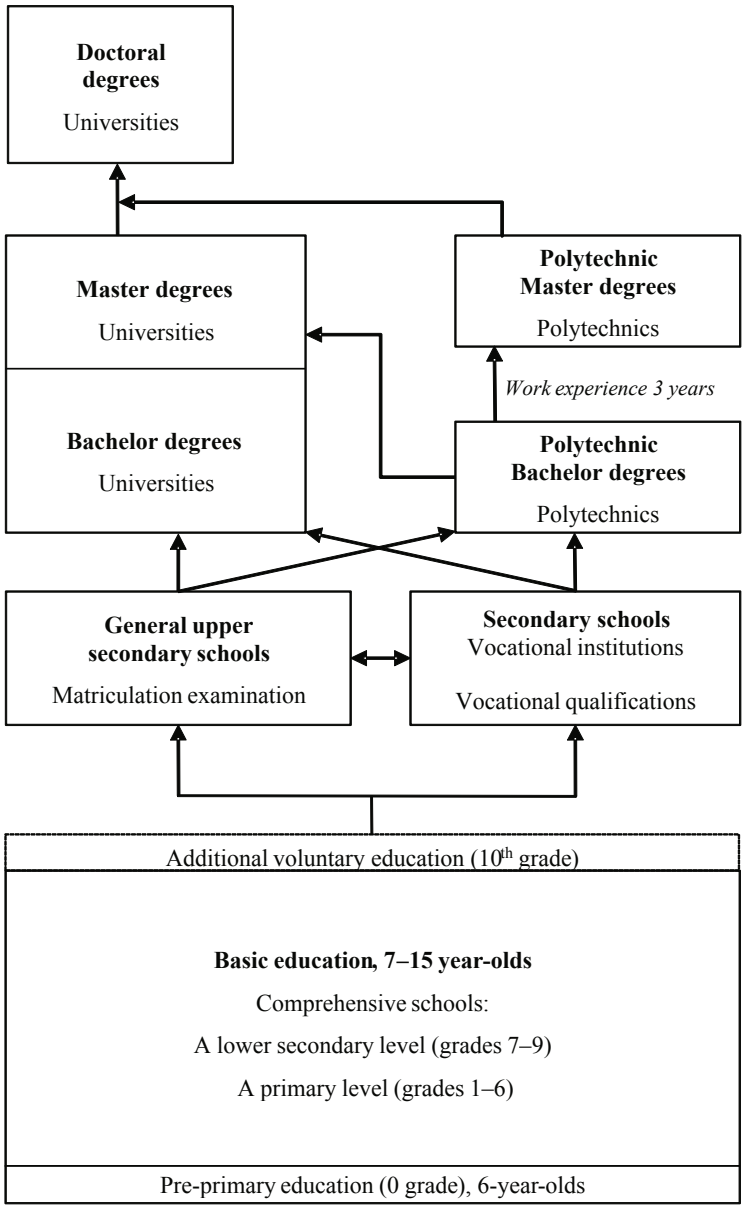

Figure 1. The educational system in Finland

In Finland, the teaching profession has been based on high moral and ethical principles for as long as teachers have been educated, i.e. for more than 150 years. This conception has continued undiminished after teacher education was moved to the universities in the 1970s (Niemi 2011; Niemi & Jakku-Sihvonen, 2010). As an initiative of the national Teacher Union an ethical council for the teaching profession was established in 2000. It is an independent organ and its main purpose is to advance the ethical nature of the teaching profession. The first ethical principles were published in 2000 (Ethical Council for the Teaching Profession, 2002, pp. 164–167).

The principals of Finnish schools have an important role to play. They are qualified teachers with extra studies in management and leadership of school organizations. They have administrative tasks but they are also pedagogical leaders. Most of them have at least a small teaching load in order to keep in touch with grass root level issues. All teachers are also considered leaders in their own special areas and are expected to make active contributions to curriculum development.

ENHANCEMENT-LED AND FORMATIVE EVALUATION POLICY FOR PROMOTING QUALITY

A quest for good learning outcomes is on the educational agenda of many countries. Globally, much controversy exists over what is the best way to use assessment as a tool to achieve high learning outcomes. Some countries have chosen standardized testing, which stresses competition between schools and focuses on measurable performances. Other countries have applied more formative aspects of evaluation. The Finnish choice has been enhancement-led evaluation at all levels of education. The assessment of processes and outcomes are regarded as an important tool to improve education.

There is no inspection system to control the educational arrangements at schools or institutions. Instead of inspection, there is an evaluation system. For basic education, following up whether schools have reached the national goals for learning outcomes set in the national core curriculum for basic education is done by national sample based assessments. Upper secondary schools have their own statute based end examination system.

Since the mid 1990s, the Finnish National Board of Education has conducted national assessments of learning outcomes, mostly in the 9th grade of basic education. Regular assessments have been carried out in mathematics, the students' mother tongue (either Finnish or Swedish) and literature, and occasionally in other subjects as well. National assessments produce information about the quality and results of education and training in relation to objectives stated in the national core curricula. These assessments are sample based and thus do not cover the whole age group. This is because the results are used for the development of education. Recently, evaluations have also been started, for example, at the end of the second grade.

The purpose of this is to enhance the use of evaluation for formative purposes. All schools in a sample of an assessment receive an individual feedback report. These reports are delivered to schools as soon as possible after the assessment data has been collected, as fresh results are more interesting for schools than results that are months old. Recently, feedback has been received as soon as two months after the data was collected (Laukkanen, 2006).

At the local level, municipalities are encouraged to produce internal and external evaluations to develop education. Policy-makers are informed about the status of education by assessments and special up-to-date reports organized by the Ministry of Education. Evaluations are implemented to find evidence to support the continuous development of education and learning. The responsible parliamentary committee stresses that evaluation also has an important social and political function in enhancing the realization of equality among people within the Finnish education system (The Parliamentary Committee on Education, 1998).

The aim of the national evaluation system is to support the local/municipal education administration and the development of schools as goal-oriented and open units, and to produce and provide up-to-date and reliable information on the context, functioning, results and the effects of the education system. The Ministry of Education is responsible for general policy making and financing educational evaluations. National evaluations are organized by special councils. Evaluations are carried out by the Finnish Educational Evaluation Council (http://www.edev.fi/portal/english). It is responsible for evaluating general education, vocational education and adult education. Evaluation of school achievement/learning outcomes in basic education is carried out by the Finnish National Board of Education (http://www.oph.fi/english/). The Finnish Higher Education Evaluation Council (http://www.finheec.fi/index.phtml?l=en&s=1) is an independent expert body assisting universities, polytechnics and the Ministry of Education in matters relating to evaluation and quality assurance systems. Beside the national evaluations, international evaluations are important in developing Finnish education. Since 2000, PISA has provided important information for the development of Finnish basic education. (Jakku-Sihvonen & Niemi, 2007, p. 14)

Balancing between a Centralized and Decentralized Administration

Finland has also balanced between a centralized and decentralized administration of education. At the beginning, comprehensive schools were very centralized, but in 1985 the municipalities' freedom and responsibility was increased. The status of the then new national curricular guidelines was to create a framework for curriculum design in the municipalities (*e.g.* Laukkanen, 2006). Ten years later, in 1994, the National Board of Education only gave very broad aims and content guidelines for teaching different subjects. The municipalities and, ultimately, the schools set up their own curricula on the basis of the national core curriculum.

Since 1999 new legislation has been provided to mainstream decentralization. Providers of education - meaning municipalities, coalitions between municipalities and private foundations - have been given wide freedom when it comes to writing their local curricula. Still, the local curricula have to be drawn up in accordance with the National Core Curriculum for both comprehensive and upper secondary schools.

The local curricula have to determine the teaching and educational practices of the schools concerned. The curricula must be drawn up in such a way that they take into account the schools' operating environments, local value choices and special resources. Education provider may decide about the implementation of curriculum in co-operation with interest groups. The aim is to ensure a high standard of general education, with relevance to society and commitment from the community as a whole to the jointly determined objectives and procedures. As it concerns pupil welfare and home-school cooperation, the curriculum must be drafted in collaboration with authorities charged with tasks that are part of the implementation of the local authority's social and health services (National Core Curriculum for Basic Education, 2004, p. 8; National Core Curriculum for Upper Secondary Schools, 2003, p. 8).

TEACHER EDUCATION AS A KEY PLAYER

In Finland, the responsibility for providing education to prospective teachers in primary and secondary schools has been transferred to universities. Since 1974, teacher education for all teachers in basic education has been arranged at universities. Before 1974, primary school teachers were educated at teacher-training colleges. In 1979, the basic qualification for secondary and elementary school teachers was defined as a Master's degree obtained in programs requiring 4 to 5 years to complete. 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, 2010; Niemi & Jakku-Sihvonen, 2006)

According to old decrees issued in 1979 and 1995, all teachers had to obtain a Master's degree for teacher qualification. In terms of the Bologna process, the degree of qualified teachers was equivalent of a second cycle degree in the European higher education area. As part of the Bologna process, teacher education in Finland moved to a two-tier degree system on 1 August 2005. The combination of a three-year Bachelor's degree and a two-year Master's degree in appropriate subjects qualifies teachers to teach subjects in primary and secondary schools or general subjects in vocational institutions. Since moving to the Bologna process the kindergarten teacher's degree has to be Bachelor in Education (180 ECTS); all other teachers must attain a Master's degree (BA 180 + MA 120 = 300 ECTS;

1 ECTS is about 25–28 hours work). Teachers for vocational schools study their vocational subjects in higher education institutions (e.g. technological universities), which are specialized in vocational content areas. All other teachers are educated in comprehensive universities.

The main elements of all teacher education curricula consist of 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. Class teachers have a major in educational sciences and minors in other disciplines.
- Research studies consist of methodological studies, a BA thesis and an MA thesis
- Pedagogical studies (min. 60 ECTS) are obligatory for all teachers. They also include teaching practice.
- Communication, language and ICT studies are obligatory.
- The preparation of a personal study plan has been a new element in university studies in Finland since 2005. Its main function is to guide students to develop their own effective programs 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.

Pedagogical Studies

The traditional distinction between class teachers and subject teachers has been retained but the structures of the respective degree programs allow them to take very flexible routes to include both in the same program or permit later qualification in either direction. The pedagogical studies (60 ECTS) are obligatory for qualification as a teacher and are approximately the same for both primary and secondary teachers as well as vocational and adult education teachers. These studies give a formal pedagogical qualification to teachers at all levels in the Finnish educational system regardless of the programme in which they are provided. According to legislation, pedagogical studies must be studies in the science of education with an emphasis on didactics. The pedagogical studies can be part of the degree studies, or they can be taken separately after completion of a Master's degree.

Universities have a high degree of autonomy in designing their curricula. Therefore, no detailed "curriculum of teacher education" covering all universities in Finland can be presented. However, there are some principles and general outlines followed by all institutions of teacher education. These are partly due to recommendations by the Ministry of Education and Culture, partly by national working groups e.g. related to teacher education reforms such as the Bologna and partly to an agreement of the Deans of the Faculties of Education and the Directors of the Departments of Teacher Education who have regular contact with each other and with the Ministry. The Ministry of Education and Culture has full confidence in the departments and faculties involved in teacher education (Meisalo, 2007, p. 163).

Table 1a. Main components of the teacher education programs for primary school teachers (class teachers) (Niemi & Jakku-Sihvonen, 2006).

Primary school teacher education program	Bachelor's degree 180 ECTS	Master's degree 120 ECTS	TOTAL
Class teacher's pedagogical studies (as a part of major in education)	25 (including supervised teaching practice)	35 (including a minimum of 15 ETCS supervised teaching practice)	60
Other studies in a major in education	35 (including a BA Thesis, 6–10)	45 (including a MA Thesis, 20–40)	80
Subject matter studies for comprehensive school	60		60
Academic studies in a different discipline, minor	25	0–35	25–60
Language and communication studies including ICT, optional studies	35	5–40	40–75

Table 1b. Main components of the teacher education programs for secondary school teachers (class teachers) (Niemi & Jakku-Sihvonen, 2006).

Secondary school teacher education program	Bachelor's degree 180 ECTS	Master's degree 120 ECTS	TOTAL
Subject teacher's pedagogical studies (minor)	25–30 (including supervised teaching practice)	30–35 (including a minimum of 15 ETCS supervised teaching practice)	60
Academic studies in different disciplines (major)	60 (including a BA Thesis, 6–10)	60–90 (including a MA Thesis, 20–40)	120–150
Academic studies in different disciplines (1–2 minors)	25–60	0–30	25–90
Language and communication studies including ICT, optional studies	35–40	0–30	35–70

ECTS means European Credit Transfer System (also called The European Credit Transfer and Accumulation System): 1 ECTS = 28 hours of students' work in studies including lessons, contact hours, examinations and all independent and collaborative activities, BA = 180 ECTS, MA 120 ECTS.

The main principles of the Finnish teacher education system can be summarized in the following way.

A Research-Based Approach as a Main Guideline

For decades, the Finnish orientation toward teacher education has committed itself to the development of a research-based professional culture (Niemi & Jakku-Sihvonen, 2011; Jakku-Sihvonen & Niemi, 2006). The critical scientific literacy of teachers and their ability to use research methods are considered to be crucial. Accordingly, Finland's teacher education programs require studies of both qualitative and quantitative research traditions. The aim of these studies is to train students to find and analyze 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 research question in an educational field, be able to search independently for information and data, elaborate on them in the context of recent research in the area, and synthesize the results in the form

of a written thesis. They learn to study actively and to internalize the attitude of researchers as they do their work (Niemi, 2011).

Professors have the responsibility to guide students in the research-oriented aspects of their education. The main object of this guidance is not the completion of the Bachelor and Master thesis itself, but actually to engage students to become active participants of education society. In this aspect of the degree program, the processes of active working and thinking are integrated in various complex and sometimes unexpected ways. The aim of the guiding process is to help student to discover and tap his/her own intellectual resources and to enable him/her fully to utilize the resources of the study group in which he/she is working. (Nummenmaa & Lautamatti, 2004, p. 117).

The goal of Finnish TE is to equip teachers with research-based knowledge and with skills and methods for developing teaching, cooperating at school and communicating with parents and other stakeholders. The leading guidelines are:

– Teachers need a deep knowledge of the most recent advances of research in the subjects they teach. In addition, they need to be familiar with the latest research concerning teaching and learning. Interdisciplinary research on subject content knowledge and pedagogical content knowledge provides the foundation for developing teaching methods that can be adapted to suit different learners.
– Teacher education in itself should also be an object of study and research. This research should provide knowledge about the effectiveness and quality of teacher education implemented by various means and in different cultural contexts.
– The aim is that teachers internalize a research-orientated attitude towards their work. This means that teachers learn to take an analytical and open-minded approach to their work, that they draw conclusions based on their observations, and experiences and that they develop their teaching and learning environments in a systematic way.

The Social and Moral Code of the Teaching Profession

Teachers' work is context-bound, depending on learner age level, cultural conditions, available resources and the contents that they are mediating to learners. Teachers and teacher education are clearly related to national goals and purposes. The welfare and economy of the society are related to the quality of educational outcomes, which are associated with teachers' competences. Besides being guided by national and local community-based goals, teachers' work also has more generic aims. Teachers open doors and windows to cultural enrichment and help people to understand other human beings and their cultural contexts. Teachers are key actors in promoting human rights, justice and democracy in a global world

(*e.g.* Aloni, 2002; Niemi, 2010). In Finland the school law contains values that promote these aims. Teachers are expected to implement them in their daily work. Since 2000, Ethical Council for the Teaching Profession has worked to promote teachers' ethical awareness. Also teacher education programs emphasize teachers' social and moral responsibility. A survey in 2010 showed that Finnish student teachers are committed to the teaching profession and be aware of the ethical bases of teaching (Niemi, 2011).

Integration of Theory and Practice

Teachers' pedagogical studies include supervised teaching practice (approx. 20 ECTS). The aim of guided practical studies is to support students in their efforts to acquire professional skills in researching, developing and evaluating teaching and learning processes. In addition, teacher students should be able to reflect critically on their own practices and social skills in teaching and learning situations. During their supervised practice periods student-teachers meet pupils and students from various social backgrounds and psychological orientations and have opportunities to teach them according to the curriculum.

Teaching practice is integrated with all levels of TE time. It is supervised by university teachers, university training school teachers or local school teachers depending on the phase of practice (Jyrhämä, 2006) (Figure 2).

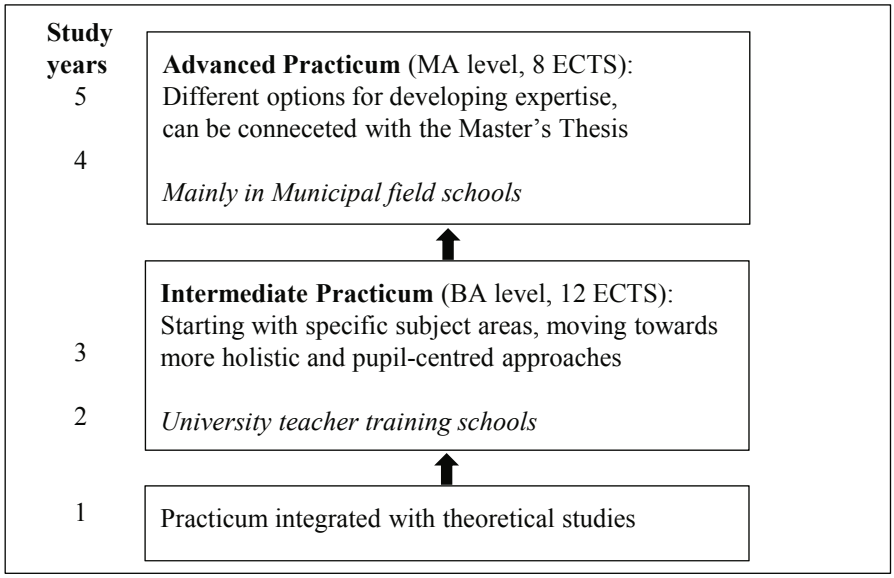

Figure 2. Teaching practice in the Finnish teacher education curricula.

The main principle is that practice should start as early as possible and support student teachers' growth towards expertise. At the beginning it guides student teachers to observe school life and the pupils from an educational perspective, then it focuses on specific subject areas and pupils' learning processes. Finally it supports student teachers as they take holistic responsibility in their teaching and schools. This period can be tightly connected with their research studies and master's dissertation.

Universities' teacher training schools (so-called "Normal schools") play a crucial role in the Finnish teacher education. The Normal Schools are state schools and their teachers have a different status than teachers in other schools. The teachers have a dual role: on one hand they teach pupils and on the other, they supervise and mentor student teachers. Many of the Normal School teachers are active in research and development and are members of teams that produce learning materials for schools.

There is also frequent critique based on the demand of having at least a substantial part of the teaching practice in more typical schools. Actually, parallel to the Normal Schools there have been so-called field schools with an important contribution to the capacity and volume of teacher education in the times of high demand of qualified teachers (Meisalo, 2007, p. 167).

TEACHERS AS PROFESSIONALS – TRUST IN UNIVERSITIES AND TEACHERS' WORK

Teachers in Finland are representatives of a high-quality academic and ethical profession. Teachers have to take an active role in raising serious questions about what they teach, how they teach, and the larger goals for which they are striving. Teachers need to view themselves as public intellectuals who combine conception and implementation, thinking and practice in the struggle for a culture of democratic values and justice. Teachers have a right and an obligation to articulate educational needs and challenges in the society they serve. They also have to be active in public debates and decisions affecting the development of schools and education. As professionals, teachers cannot only be implementers of decisions, but must also be partners in their development. Teachers are expected to be able to take an active role in evaluating and improving schools and their learning environments. They are also expected to refresh their professional skills, to cooperate with parents and other stakeholders, and to be active citizens (Teacher Education Development Programme, 2001).

Universities do not give any certificate of teacher qualifications. They only provide the education and training required to fulfill the demands that are needed for teacher qualifications. At graduation, students are given a certificate for their university degree. Students can choose between different options for their own teaching career, and there is a variety of possible degrees that qualify them as teachers. Employers or, in the Finnish case, municipalities, require that a teacher

candidate has completed all the studies required by law for the teaching profession and the teacher qualification. Universities are autonomous and can provide different profiles in teacher education. Universities negotiate every three years with the Ministry of Education on their strategic plans and results in teacher education.

Finnish teachers are recognized as professionals, and the teachers' trade union considers this status to be very important. Almost all teachers belong to the same teachers' trade union (OAJ), which is a very powerful agency. It has been invited to play an active role as a partner in all major reforms of teacher education and school curriculum in the last decades. It has also promoted the policy of the master's degree as teachers' basic qualification. Finland has no inspectorate, no probation time for newly graduated teachers' or national school achievement testing. Finnish society considers teachers to be professionals who are morally responsible for their work.

The society's trust in universities' degrees as well as teachers' competences is mediated via trust in the universities and makes them very accountable. Trust is not a stable and permanent status. Results and quality must be assessed and evaluated systematically. Therefore universities' own quality assurance methods are important (all Finnish universities will be audited by 2011). Teacher education has also been evaluated several times nationally and internationally in the last two decades. Evaluations have been enhancement led and their purpose has been to produce improvements in teacher education. There is a close cooperative relationship between universities and the Ministry of Education and Culture in teacher education issues. Many research projects into teacher education have been also carried out jointly. The recent recommendations from the Ministry of Education and Culture stress the importance of strengthening research in and on teacher education. The Ministry of Education and Culture also requires universities to reorganize conditions for teacher education research.

CONCLUSION

The OECD review team looking at equity in the Finnish education system (OECD, 2006, P. 48) expressed the view that the Finnish strategy has taken a long time to mature and is composed of several interrelated issues. The team writes: "This is a complex of practices that has emerged over time, but it must be maintained since any weakness in one component will undermine other practices." The miracle of the Finnish education is an outcome of a purposeful policy and practice. The educational system and teacher education have together supported the aims of equity and teachers' professional autonomy. There are a number of reasons that all together have resulted in high learning outcomes. Many of those factors are mutually dependent and interconnected. If any one of the factors is dramatically changed, it may affect the whole. The success is based on the combination of political will, purposeful efforts to promote equity

by the educational system, high quality teacher education, teachers' professional and moral responsibility, and society's trust in the educational actors.

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3. FINNISH TEACHERS AS 'MAKERS OF THE MANY'

Balancing between Broad Pedagogical Freedom and Responsibility

ABSTRACT

Finnish teachers have recently been at the focus of interest of the international media, public decision makers and politicians as well as researchers into teaching. The results of Finnish pupils in PISA have encouraged many people to inquire about the characteristics and atmosphere of Finnish schools, and especially the working conditions as well as the enthusiastic, committed orientation of Finnish teachers. This chapter describes the work of Finnish teachers, their pedagogical responsibilities and freedom related to their role as well as their pedagogical thinking at the background of their everyday work in classrooms with pupils. Finnish teachers participate in the administrative and the pedagogical decision-making processes of their own schools as well as at the various levels of the Finnish school system, they are able to influence their work, and thus, they have broad pedagogical freedom and also broad responsibilities related to these role tasks. Finnish teachers manage their work as teachers and educators by negotiating, dialogues, a democratic way of pedagogical thinking and acting in challenging situations. These ways of working are based on a certain kind of ethos, which is characterised by hope and trust among teachers, principals, and administrators. This kind of ethos provides additional support for successful teaching. Finnish teachers are committed to learning, participation and active agency in their pedagogy, in their collaborations with various people as well as active participation in questions related to schooling and education. Their academic, master's level teacher education as well as their societal role encourage them to act according to this manner. Although Finnish teachers are committed to their work, recent research and reports of teacher's trade organisation have shown that they also feel inadequate and exhausted by their work.

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 39–54.
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Keywords: teacher's role, pedagogical freedom, responsibility, negotiation

INTRODUCTION

A career in teaching is an appreciated and popular profession in Finland, and many young people are willing to choose it as their life career. There are several thousands applicants to teacher education institutions every year, and only 8-10% of the applicants will enter universities to start their studies (Statistics of VAKAVA, 2010; 2011). The OECD report (2003) Attracting, Developing and Retaining Effective Teachers (Country Background Report for Finland) emphasizes the "high social status" and "competitiveness for entry" as the well-known characteristics of a teaching career in Finland (OECD report, 2003). Consequently, the calibre of Finnish student teachers is high. As noted in the report, "entry to teacher education is still highly competitive from well-qualified candidates" (OECD Report, 2003).

This broad interest towards teaching professions and the amount of highly qualified applicants for teacher education programmes are naturally the starting point and fundamental prerequisite for successful teacher recruitment. Most Finnish teachers continue in the teaching profession for all their working lives and quite independently take care of their professional development (Webb *et al*., 2004). There is no precise data available on the extent of teachers' transition from schoolwork to other labour markets. According to the OECD report (2003), it is estimated that approximately 10–15% of those who have completed teacher education programmes will move on to assignments outside teaching at some point in their careers. Some teachers progress to headmaster positions during their careers, and some move on to other educational professions, like publisher companies or personnel management positions. There is a growing need for continuous in-service teacher education and support for teaching work in order to retain effective teachers in schools. The intention is that teachers should remain in the teaching profession for as long as possible – even to the point of the retirement. Both nationally and internationally, there is growing evidence (Boyd *et al*., 2011; Mancuso *et al*., 2011; Pyhältö *et al*., 2011) that management of educational institutions and schools is an effective way to support teachers in their work.

Although Finnish teachers have strong master's level education, pedagogical knowledge and theoretical understanding of their work, pedagogical action and decision-making in practical classroom situations is not an easy task. Current research on Finnish teachers has shown that interaction with pupils in socially and pedagogically challenging situations constitutes the core of teachers' pedagogical wellbeing. Success in both the pedagogical goals and more general social goals seem to be fundamental preconditions for teachers' experienced pedagogical wellbeing in their work. Also, teachers' pedagogical wellbeing is

centrally generated in the challenging social interactions of their work. (Soini *et al*., 2010) According to the teachers themselves, they do not necessarily have the relevant competences to do their work, and they are not always aware of the impact and possible consequences of their actions and decisions (Husu & Tirri, 2001). Teachers' working environments in Finnish schools have become more heterogeneous, and teachers feel that challenges related to their pupils' backgrounds, diversity, differences in schools, and the role of school have increased, and thus, the implications for their teaching and for their pupils' learning has become more significant (*cf*. Hautamäki *et al*., 2000; Jakku-Sihvonen, 2002). The emotional load and stress related to working conditions has affected teachers' wellbeing, and thus, there have also been discussions in Finland about the rise in the numbers of teachers leaving the profession (*e.g*. Pyhältö *et al*., 2011).

This chapter describes the principles and structures framing Finnish teachers' work as well as the practices and challenges within this framework at the school level that these academically educated teachers have to face. In order to understand the comprehensive construction of Finnish teachers' work in schools, their pedagogical work is considered from the viewpoint of the role requirements for modern teaching work. The educational context within which Finnish teachers work is relatively open and is based on trust between political and administrative decision makers and teachers, but – at the same time – it sets rather demanding expectations and responsibilities for teachers. The teaching profession requires thoughtfulness, consideration, and tolerance in the midst of teaching and educational work, and teachers are educated for this way of teaching during their pre-service teacher education.

TEACHERS' WORKING SPACE IN FINNISH SCHOOLS AND CLASSROOMS

The working space of Finnish teachers is understood and defined at many different levels. The legislative and administrative frames of educational policy regulate the functions of educators on a more practical level. The Basic Education Act (lakipykälä) defines the main guiding principles concerning educational equality and equity. In the educational setting and practice, this means e.g. the same comprehensive schools for all pupils, a very limited number of private schools, allowing a great heterogeneity of pupils, and fostering multicultural policies and practices in schools. The time allocation of subjects and the National Core Curriculum (2004) defined by the Council of State formulate the prerequisites for school-level instructional work. The local school curricula planned and constructed by the municipal authorities, principals and teachers regulate the pedagogical activities – principals' pedagogical leadership, teachers' teaching and pupils' learning – at the school level.

The guidelines for the formation of school operational culture and the learning environment are defined in the Finnish *National Core Curriculum* (2004, p. 17),

which emphasises the uniform development of all official and unofficial school practices in order to support teaching and learning at schools. "The objective is an open interactive operational culture that supports cooperation both within the school and with the home and rest of the society (National Core Curriculum, 2004, p. 17). A supportive learning environment, which promotes interaction and dialogue between teachers and pupils as well as among the pupils, is explicitly outlined and emphasised (National Core Curriculum, 2004, p. 17). As Kumpulainen & Lankinen (2011, in this book) point out, one of the major goals of Finnish basic education is to support the growth and development of all pupils, strengthening their opportunities and involvement in learning. It is important that this definition of equity is comprehensive in its nature meaning that all teaching to all pupils should take into account these factors. Thus, equity is measured both in terms of good and appropriate teaching and supportive and individualized care being provided for the pupils.

The administrative regulations of educational policy outline the framework within which Finnish teachers work. Through these outlines, the norms, requirements and demands on the teaching profession and the *teacher role* in Finland are also determined and set. Teachers should act both directly and indirectly along the public interests that are related to communal values. Teachers as professionals hold social role positions, which encompass expectations both for their behaviours and that of their colleagues (see *e.g.* Brophy, 1982; Buchmann, 1986; Beck, 2008). The teacher role embodies high aspirations, and in the school context it provides certain mechanisms and patterns for guiding action in its light. Teachers should act in a professional role in their work; this should apply regardless of their own personal opinions. Therefore, in order to fulfil their mandate correctly, teachers are not allowed to operate in an informal, ad hoc manner (*cf.* Lortie, 1975).

In Finland, teachers are expected to act according to prescribed educational aims and values. Their work is carried out within schools, where the given educational aims and values are contextualized. Naturally, all the criteria for teachers' pedagogical actions cannot be stated explicitly. The variety and pervasiveness of pedagogical situations is such that a great deal of teaching depends on the personal presence of teachers and their ability and willingness to do what is appropriate in teaching situations (Husu, 2002). Thus, making pedagogical judgments can be understood as an on-going aspect of teachers' daily work and all teacher action has an inescapable moral dimension (Tirri & Husu, 2002; Husu & Tirri, 2007). In addition to teaching academic skills, Finnish teachers are responsible for many other pedagogical tasks and duties found in their profession. A teacher's main professional task is to promote the full potentiality found in every pupil. This educational aim brings the concept and practice of care to the forefront of teachers' work in schools. In teaching, care is conveyed in many ways. At the institutional level, schools are organized to provide pedagogical continuity and support for trusting relationships between

teachers and pupils. At the local and individual level, teachers do their best to show their caring for pupils through specific forms of attention, by co-operating with their pupils' parents, and by carefully guiding the growth of the pupils in their charge. As educational research has shown (see e.g. Noddings, 2002; Niikko, 2004; Juujärvi *et al*., 2010), these kinds of personal manifestations of care are crucially important and effective in pupils' lives. However, it should be emphasized that the concept of practising caring is not confined to personal relations in schooling. Also, the curriculum can be selected and developed with caring in mind. Teachers can manifest their care in their choice of curriculum, and an appropriately chosen curriculum can contribute to the growth and development of pupils (Vitikka *et al.*, 2011, in this book). Finnish teachers participate in the preparation of local school-level curricula and make choices related to them, participate in general pedagogical decision-making and distribution of resources at schools (Sahlberg, 2007; Niemi, 2011 in this book; Kumpulainen & Lankinen, 2011 in this book).

TEACHER'S RESPONSIBLE PEDAGOGICAL ACTION

The context of Finnish school presupposes and requires multidimensional and pro-active pedagogical action from teachers. The role makes demands on a teacher and the responsibilities and requests related to the task of teaching itself formulate the ground on which Finnish teachers work. Teachers are expected to act within the borders of their professional role. In addition to those role-oriented manners, their personal characteristics and preferences play a role in their professional work as teachers.

Finnish Teachers' Role Requirements

Finnish teachers are strongly involved in the construction of their own local school level curriculum that is based on the National Core Curriculum. The school level curriculum sets the concrete framework for teachers and guides their practical work by defining the aims, contents and methods for teaching and learning (National Core Curriculum, 2004, pp. 16–17). This school level curriculum allows teachers to organise classroom activities quite freely and choose the teaching methods, teaching materials and assessment methods they use with their pupils. Teachers can also influence the grouping of pupils and their teaching schedules to some extent in order to optimize their pedagogical action. Finnish teachers teach those subjects that they specialised in during their teacher studies and they are able to make use of their personal strengths in choosing the methods they use to teach their classes. Most Finnish teachers use innovative teaching and learning methods, and materials as well as ICT and educational technology (e.g. Lakkala, 2010; Muukkonen, 2011; Ilomäki, 2008),

but many of them still teach in a relative traditional, teacher-centred manner. Interestingly, this may be one of the reasons behind the Finnish success in international PISA assessments. As Sahlberg (2007) and Simola (2005) have argued, ideas for improving teaching and learning in schools have usually been transferred from past good practices and teaching traditions in Finland. This kind of pedagogical conservatism has created "a pedagogical equilibrium between progressivism and conservatism through learning from the past and teaching for the future" (Sahlberg, 2010, p. 337).

Finnish teachers are encouraged to collaborate pedagogically with their colleagues, and they have opportunities to do this during their working hours. Teachers organise shared teaching periods, co-prepare teaching materials for pupils and even co-teach with colleagues (see Niemi, 2011 in this book). The school festivals and other special events related to specific profiles and school topics, like nature weeks, science projects, sports events, and the like are often organised collectively. Parents are actively involved in school-home partnerships for example through curriculum work, membership in a school's board, assessment discussions, parent events, school festivals and meetings. Finnish teachers also actively collaborate with other important institutions, companies and actors in their communities (see Vitikka *et al*., 2011 in this book). Finnish teachers are also intensively integrated in multi-professional collaborations, which aim to support their pupils' wellbeing comprehensively during their time at school. In Finnish schools, the principal, teachers, special education teachers, school psychologists, public health nurses and social workers form a group, which takes care of every pupil in the school (Laukkanen, 2008). These relationships form the multiple networks and democratic, negotiating co-operative relations that are involved in Finnish teachers working contexts.

Finnish teachers' relationship with their pupils can mostly be characterised as equal and democratic. Teachers aim to construct their pedagogical authority in an equal relation with their pupils, rather than in an authoritarian top-down manner (*cf*. Harjunen, 2009). The guidelines for this approach to the treatment of pupils are in the Basic Education Act as a principle of equality in the *National Core Curriculum* (2004), as a form of humanistic conception of man and in the socio-constructivistic conception of learning (National Core Curriculum, 2004, pp. 12–16). The general aims and goals of learning as well as guidelines for assessment both during the learning process and at its end; support, guide and encourage the pupils' learning (National Core Curriculum, 2004, p. 260). Added to this, the task of assessment is to help pupils form a realistic image of their learning and development. It is also stated, that "[pupil assessment forms a whole, in which on-going feedback from the teacher plays an important part. With the help of assessment, the teacher guides the pupils in becoming aware of their thinking and actions and helps them understand what they are learning" (National Core Curriculum, 2004, p. 260). Besides the

outlined principles, the democratic ethos of relationships between teachers and pupils is influenced by traditions that have been developed over time in Finnish schools.

Finnish Teachers' Personal Characteristics and Qualities

The teaching profession is highly appreciated in Finland, and this fact is shown in the huge numbers of applicants for places in teacher education institutions. Every year, about 6500 young people apply primarily for class teacher education to institutions around Finland, and only about 800 of them pass the entrance examinations and start their studies (VAKAVA Statistics, 2010; 2011). In subject teacher education, students apply first to their subject faculty and then to the pedagogical studies organised in departments of teacher education. This means that student teachers are talented young people who have done well in their upper secondary school studies. Both class teachers and subject teachers complete about 5 years of master's level studies at university in order to become qualified teachers and to be able to work in the lower or upper grades of comprehensive schools (*c.f.* Niemi, 2011 in this book). The courses for Finnish student teachers are designed to impress a research-based orientation towards their practical teaching work on the students. They are also guided to learn reflection as a way of thinking and as a tool for continuous professional development (Husu, Toom & Patrikainen, 2008; Juuti, Krzywacki, Toom & Lavonen, 2011). Finnish student teachers and employed teachers are highly committed to their teaching work (Niemi, 2011) and involved with their colleagues and schools.

One of the central aims of teacher education is to support student teachers in discovering their personal strengths and constructing their professional identities based on these strengths. However, teachers only fully realise their own strengths and find their own ways to teach when they start to work as teachers. This is problematic because everyone likes to be told that "being oneself" or "a firm following of the code of ethics" is all right, even laudable. But what are teachers' personal strengths and their own ways to teach? Teacher autonomy and self-realization are indisputably one of a teacher's personal goods. However, as Buchmann (1986) emphasizes, schools are for children, and children's autonomy and self-realization depend in part on what they learn in schools. Thus, "self-realization in teaching is not a good in itself, but only insofar as pursuing self-realization leads to appropriate student learning (p. 538). Teachers are persons, but being one's self in teaching is not enough. The person must be paired with the obligations contained in a teacher's role.

Both through the terms of action outlined in National Core Curriculum as well as through the Finnish academic teacher education, Finnish teachers are able to make use of and act in an authentic way in their teaching practice (see *e.g.* Tirri & Husu 2002; Tirri, 2003; Husu & Tirri, 2007; Hanhimäki & Tirri 2009; Gholami

& Husu, 2010). This means that a teacher's role, obligations and personal prescriptions can be combined (Sockett, 2009), and then the concept and practice of *authenticity* (Halliday, 1998; Kreber, 2010) constitute a crucial link between teaching and the achievement of students' complex educational and learning outcomes at the classroom level. Authenticity consists of pedagogical actions that are routinely performed by teachers, it involves working with students, promoting knowledge of the practice of teaching, prompting teacher self-reflection, and serving formative purposes (Iverson *et al*., 2008). When practicing authenticity, teachers balance their actions and thinking both with situational appropriate role demands and personal preferences. Teachers' authentic way of action entails a disposition to act on reasons, and this is especially emphasised and practiced during Finnish research-based teacher education as a form of teacher's pedagogical thinking (*cf*. Kansanen *et al*., 2000; Husu, 2002; Toom, 2006). It is exercised in making decisions and built up by constant deliberation.

EDUCATING WITHIN A SOCIETY – THE MINDSET OF THE FINNISH EDUCATIONAL SYSTEM

Explaining the general high level of the schools in Finland is an extremely complex task: it involves good infrastructure (modern school buildings and facilities), qualified and well-trained teachers, state-of-the-art technology etc. – but the list does not explain everything. The way of organizing educational policy into pedagogical practice does not solely make good things happen in schools. Behind this foreground, there is also a background in Finnish educational policy that paves the way for success in schoolwork: our democratic and consensus-seeking ethos in political decision-making. We call this the mindset of the Finnish educational system. This mindset of educational policy and educational thinking can be seen in attitudes and assumptions held by the majority of Finnish people. This mindset functions interdependently on all levels of educational decision-making and teaching practice, and between all civic and professional participants: major politicians, educational administration and governance, teachers, and parents – even pupils share it to some extent. It (tacitly) creates a powerful incentive within these people to continue to adopt or accept certain behaviours and choices in their actions and in their educational decision-making (*cf.* Bruner, 1996; Bonnet, 2002).

This tradition dates back at least a century to a respect for learning and education as a core of Finnish culture and the statehood of a developing nation (*cf.* Niemi, 2011 in this book; Simola, 2005). In modern times since the 1960's, political authorities from left to right have seen comprehensive education as a key to survive and thrive in our increasingly competitive world. All governments over the past four decades have emphasized economic growth as their primary goal, with comprehensive education as its critical driver. The phrase "investment in people is the best investment" summarizes this educational consensus and political

aim. Consequently, educational policy in Finland has not been polarized neither between major political parties nor their supporting citizens. This may have proved to be one of the key factors behind the continuity of Finnish education policy – and the success of our schools (*cf*. Psacharopoulos & Patrinos, 2004; Sahlberg, 2007). Next, we will briefly characterize the Finnish educational mindset through which all parties involved – politicians, administrators, teachers, students, and parents – conduct their reflection of educational issues. We have defined two central interdependent facets of this Finnish educational mindset: *trust* and *hope,* through which we consider the context and background of Finnish teacher's work.

Trust in Education

Trust between individuals and groups provide the basis for social order and it is a foundation of solidarity and integration within societies (Durkheim, 1956). A normal and routine life would not be possible without both an explicit and an implicit and unconsidered trust. Hence, trust facilitates stability, co-operation and cohesion (Elster, 1989). Trust is the most basic premise upon which different approaches to educational policy and educational practice can rest (see *e.g*. Spiecker 1990; Troman, 2000*;* Curson-Hobson, 2002*;* Cook-Sather, 2002). The educational institutions and practices that have prevailed in Finland both historically and currently reflect a long-standing trust between the partners in the educational system (Rinne, Kivirauma & Simola, 2002; Simola, 2005; Sahlberg, 2007).

In Finnish society, the public's trust of professionals (including teachers) and public institutions (including schools) is seemingly high. Schools are given almost full autonomy in developing their daily delivery of education services. This positive situation paves the way for a kind of democratic professionalism (Dzur, 2008; Husu & Toom, 2010), where teachers, while still valuing the specialized knowledge of their profession, can work collaboratively with lay people, enabling them to deliberate and make decisions on issues that affect them and their children. Teachers can be seen as democratic professionals, like "bridge agents" who connect the school institutions in which they work with the lay public of parents and their children to deliberate over important social issues. Schools can provide a sort of "middle democracy" and a "ground-level network of lay participation" between institutions and individuals (Dzur, 2008, p. 38). Here, teachers as professionals act as some of key players who create opportunities for citizen participation and deliberation in public issues within their community. It is difficult to evaluate the actual meanings and consequences of these pedagogical and social processes. However, the development of the teaching profession towards a "democratic profession" can be seen as a essential shift in the teaching profession in our society and our schools to one based on trusting, listening to, and respecting the opinions of all participants in schooling.

It is commonly acknowledged that educational relationships cannot be established and maintained without a strong bond of trust existing between teacher and pupils (Troman, 2000). In teaching, there is a basic need for trust because teaching is an "emotional practice" that involves trustful relationships between all partners (Hargreaves, 1998, p. 5). Trust is of prime importance in teaching: it ensures that participating individuals at every level of the educational system can be allowed greater freedom and afforded greater autonomy (Cook-Sather, 2002, p. 4). Also, trust is a pre-condition for co-operation (Gambetta, 1988). In pedagogical encounters, high levels of trust are required among participants (teachers, students, parents) for the development of *"communitas"* marked by a strong feeling of camaraderie, a sense of common destiny, [and] mutual support (Woods, 1995, p. 93). We especially consider important the trust relations between persons (administrators, teachers, students, parents) at all levels of schooling. These experiences of trust (and distrust) in daily schoolwork have deep and lasting impacts on individuals and their communities.

Hope for a Better Society and Individual Life

Hope most generally refers to a desire for positive futures that are considered possible, but not guaranteed. The term consists of understandings of future-oriented thought, feeling, and action (Amsler, 2008). Even if there have been serious attempts to systematize the definition of hope (see *e.g.* McInerney, 2007; Singh & Han, 2007; Renner, 2009) the concept remains discursively diverse. In the social sciences, hope is commonly associated with problems of subjectivity, agency, and social and political change. In other fields, it is related to motivation and self-esteem (psychology), imagination (creative arts), and pedagogy (education). The concept and practice of hope has been variously described e.g. as "an element of human nature, a way of knowing, a form of action or behavior, [and] learned orientation to the future" (Amsler, 2008). As Inglis (2004) states, "a society's education entails (in all senses) its future" (p. 4). Hope is premised on the idea that human beings are capable of shaping the forces that structure their lives.

While not wanting to naïvely praise educational hope, we use the term in a 'good sense' (Coben, 2002) for its provision of legitimate optimism and anticipation about the meaning of education for the future of young people in particular, and for the Finnish society in general. These themes connecting education and hope are echoed by many authors (*e.g.* Albert, 2006; Giroux, 2002; Thrupp & Tomlinson, 2005) in the educational literature. Also, this literature connects education and hope with a particular vision of democracy (Giroux, 1989; 1997; 2005; Halpin, 2003) – one that renews a focus on justice and equal opportunities. Halpin (2003), for example, declares the aims of education as being "a more equal and more democratic education system and society" (p. 5). This kind

of an optimistic vision provides a "vocabulary of hope" (Halpin, 2003, p. 34) – a notion that echoes what Giroux (1989) calls the "language of possibility" (p. 31). The stance is based on democratic ideals, because democracy itself, as Giroux (1997) conceives it, is a utopian project for the public good, a "project of possibility," an ideal end in itself (p. 223).

These idealistic tones are closely related to education's tasks and ability to promote social hope in societies. In Finland, the socio-political project to create a welfare state, where basic social services, including education, have become public services for all citizens, has promoted the social role of education (Sahlberg, 2007, Castells & Himanen, 2002). The welfare state can also be seen as an educational project where one of the main tasks of the educational system is to increase the level of social capital among citizens: i.e., improve their opportunities and willingness to learn. Carnoy (2007) calls this state-generated social capital that is expressed in social contexts for education. The efforts to make our schooling institutions and our civic attitudes stronger have been manifested in the development of social hope (*e.g.* Rorty, 1999; Green, 2008; Westbrooke, 2005). It aims to ground democratic institutions (*e.g.* schools) more deeply in the everyday living of our democratic societies. Also, promoting social hope means encouraging abilities to achieve more deep participatory democracy in society and in its institutions.

As presented, within the context of Finnish education, the language of hope is a powerful tool to move teachers and students in their educational settings. Teaching as a teacher's primary work can also be seen both as a practice and as a "discipline of hope" (Kohl, 1998). Conceptualizing education as a resource of hope (Amsler 2009, p. 1191) gives us an insight into the power it can have for people in Finnish society in general, and people in educational institutions in particular: the hope that education can promise brighter individual and societal futures. Uncovering this idea allows us to better recognize how emotions such as hope (and fear) work to orient people's social action – in this case, shaping the character of educational practices and its outcomes.

DISCUSSION: NEGOTIATING FOR A HOPEFUL CURRICULUM AND SCHOOL PRACTICES

Finnish schools, like all schools globally, are more and more intensively understood as socio-political arenas (Dzur, 2008; Lieberman & Pointer Mace, 2010), where teachers, pupils and parents in collaboration with public administration and other citizens participate in the definition of school education and teaching as well as its practical implementation. Finnish teachers work in this Finnish context of education and schooling, which has its own characteristics, possibilities and challenges at every one of its levels. An interesting question is what would happen if one of these factors were shaken, changed or even removed

from the context of action? What would happen, if actors on all levels lost their trust in education and hope for a better society and individual life? What kinds of pedagogical practices – teacher's teaching and pupils' learning – would emerge at the school level? Would it turn out to be a survival game in the classroom? As Sahlberg (2010) reminds us, there are future challenges to be met: i) the Finnish educational authorities are also tightening their controlling grip over schools and the abilities of teachers to make autonomous decisions about schooling practices; ii) the governmental Education Sector Productivity Programme (Ministry of Education, 2005) calls for schools and teachers to do more with less, proposes major changes in school networks and increasing class sizes; iii) productive gains are sought by reducing special education and counselling services in schools and so on. In sum, these developments "may turn out to be harmful for the high social capital of Finnish schools (Sahlberg, 2010, p. 345).

The unity of the entire educational system sets high demands and continuous challenges for all actors on all its levels. It requires shared views of education as well as continuous work and negotiations towards these aims. In the Finnish context, these negotiations are mostly concretized through the continuous processes of the National Core Curriculum and local school curricula. Renner and Brown's (2006) idea of a "hopeful curriculum" including the facets of *community*, *praxis*, and *courage* come close to the present Finnish way of action, which could be even more dynamic in many parts. Even more critical action and reflection among teachers, pupils, principals and parents in schools could be encouraged. Meaningful learning can take place in schools and classrooms only through a connectedness to the material contents of teaching and learning, an authentic connectedness between these and the world outside classrooms, and, most importantly a connectedness between pedagogical actors, teachers and students. (Renner & Brown, 2006.)

The hopeful curriculum aims at the thorough development of schooling and education through *praxis*: teachers' and students' action and reflection upon the world. The stance of praxis connects action with reflection and strives to craft new lenses on the world. These lenses provide us with a more nuanced and complex vision of the tasks facing our schools, and the teachers and students who tackle them (Renner, 2009). With a more critical understanding of their world, teachers and students can work together to figure out how they can become transformative agents to deal with the problems facing us in our society. In this venture, *courage* is an essential element of pedagogical thinking and action. (Renner & Brown, 2006; Renner, 2009.)

In many aspects, the Finnish teachers' way of action within the framework of pedagogical freedom and responsibility are (still) well functioning and reasonable. A more difficult question is, how will Finnish teachers, principals, policy makers and researchers be able to maintain this united supporting and promising situation for the future generations?

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4. THE CORE OF SCHOOL PEDAGOGY:

Finnish Teachers' Views on the Educational Purposefulness of Their Teaching

ABSTRACT

This chapter explores the core of school pedagogy both theoretically and empirically. The main concepts in research into teaching are introduced with some discussion on their traditional background. The differences in the terminology used in German and Anglo-American literature are acknowledged and their influence on Finnish research on teaching is discussed. Educational purposefulness is identified as an important motivational factor behind the teaching-studying-learning process. Empirical data from Finnish teachers and student teachers are presented as examples of their views on the educational purposefulness of their teaching. In the secondary school context teachers need skills to teach their subject matter in ways that would open up its educational meaning. Finnish teachers' views on the educational purposefulness of their teaching are divided into two categories: general purposes in teaching and subject matter specific purposes in teaching.
Keywords: school pedagogy; educational purposefulness; secondary school teachers; teaching

INTRODUCTION

In many European countries, for example in Finland, the goal of education is to support the development of the whole person, rather than merely the cognitive domain (National Core Curriculum for the Secondary School, 2003). This kind of education acknowledges the importance of social and affective domains in students' development, including their emotional and spiritual concerns. In this chapter we discuss how didactics, the science and art of teaching, can promote this

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 55–66.
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educational goal, and what kinds of views Finnish secondary teachers of different subjects have of the educational purposefulness of their teaching.

First, we will define some central concepts in the research on teaching and discuss the different terminology used in this field in Europe and in the United States. The two main concepts discussed here include didactics (Hopmann, 2007; Kansanen, 2002) and pedagogical content knowledge (Shulman, 1986; 1987). Second, we will discuss the nature of educational purposefulness from philosophical (Watermann, 1993), developmental (Damon, 2008) and didactical (Hopmann, 2007) points of views and show its importance in the totality of teaching-studying-learning process (Kansanen, 1999).

Third, we present some examples of Finnish secondary school teachers' and student teachers' views on the educational purposefulness of their teaching. Based on the empirical data we discuss the general purposes in teaching that are mutual to teachers of different subjects and subject-matter specific purposes in teaching that are related to the subjects taught. Finally, we identify the core of school pedagogy by reflecting on the empirical data against the theoretical concepts and discussions about research into teaching. The results show a strong value-base on holistic pedagogy among Finnish teachers that is in accord with the educational goals in the national curriculum.

MAIN CONCEPTS IN RESEARCH ON TEACHING

Didactics

The modern understanding of "Didactics" (die Didaktik) is an invention of nineteenth-century teacher education in Germany and in Nordic countries including Finland (Hopmann, 2007, p. 110; Kansanen, 2002, pp. 430–431). In the Anglo-American literature the concept of didactics is not usually used with the same meaning as in our tradition. Kansanen warns against the negative connotations this term might imply to Anglo-American colleagues and suggest using some other terms in translating this concept into English (Kansanen 2009b, pp. 29–30). The Anglo-American terms that may have the closest meanings to the European didactics include the concepts of "pedagogy", "teaching-studying-learning process" or "the science and art of teaching".

Hopmann and Riquarts (1995) recommend using the term "didaktik" instead of didactics as a translation of the German Didaktik in the English language texts. They have made an effort to create a concept without the negative connotations of didactics while retaining a term that is close enough to the original in order to indicate the real nature of the term. Kansanen has followed their recommendation in his writings and used "didaktik" with a small letter (Kansanen, 2009b, p. 30). In the title of this chapter we have acknowledged this discussion on translating didactics into English and use the broadest concept available, school pedagogy, which is understood in the similar ways by both European and Anglo-American

readers. This term reflects the holistic and context-dependent nature of teaching in Finnish schools.

One important aspect of the German Didaktik on which our didactics is based on is that it has both descriptive and normative faces. Values play an important role in German didactic models and they also guide the teacher in the teaching-studying-learning process. This has influenced the Finnish tradition in teaching mainly through the curriculum. The mutual value base of teaching is defined in the national curriculum and teachers of different subjects need to conform to the values in the curriculum (National Core Curriculum for the Secondary School, 2003). This makes education normative in nature and has implications to the teacher's role as a moral educator. Every teacher is a moral educator regardless of the subject matter taught. Another important aspect that discerns didactics from educational psychology is that it is always context-dependent. Context-dependency means that the teaching-studying-learning process is intentional; that actions are based on values and purposes, and that the process is located in some institution in the society. Furthermore, the teachers are involved as professionals with institutional teacher education and it is assumed that the outcomes of studying, with learning as the most important part of them, are achieved within the framework of a systematic curriculum (Kansanen, 2002, p. 434).

Pedagogical Content Knowledge

In the Anglo-American tradition Shulman (1986) has developed a new framework for teacher education by introducing the concept of pedagogical content knowledge. He argues that teacher education programmes should combine two knowledge bases to more effectively prepare teachers. These two knowledge bases are content and pedagogy. A crucial aspect of teachers' knowledge development of how to teach their subject is subject matter knowledge. A second kind of content knowledge is pedagogical knowledge, which goes beyond knowledge of the subject matter per se to the dimension of subject matter for teaching. Pedagogical content knowledge is located in the intersection of content knowledge and pedagogical knowledge. Pedagogical content knowledge is unique to teachers and separates, for example, a science teacher from a scientist. With this knowledge a teacher can teach a certain context to different learners effectively and with special attributes that help her/him guide a student to understand content in a manner that is personally meaningful (Shulman, 1987).

Kansanen (2009a; 2009b) has discussed the similarities and differences between the Anglo-American concept "pedagogical content knowledge" and the European concept "subject-matter didaktik". According to him pedagogical content knowledge is a rather narrow concept. It is the teachers' professional knowledge, knowing how to prepare content for the students in a way that studying and learning is as effective as possible. However, it does not contain the process of how

to transform the disciplinary content to subject matter content in the classroom; that is, creating a school subject. According to German thinking, this process of transformation is a central feature in constructing the instructional process in the classroom. In order to make this distinction clear Kansanen argues that in pedagogical content knowledge the teacher is functioning in a smaller circle than in subject-matter didaktik wherein the relation to the basic discipline of the school subject is active all the time. The teacher must also be competent enough to deal with this relation successfully (Kansanen, 2009b, p. 34).

In the current Anglo-American research in teaching the concept of pedagogical content knowledge has been developed further. For example, in the context of science teaching and technology the concept has been extended to the phenomenon of teachers integrating technology into their pedagogy (Mishra & Koehler, 2006).

Pedagogical content knowledge can also been used broadly referring to pedagogy in general. Used in this way it comes close to the German concept. The German researchers have started to use the term "school pedagogy" with which they refer to a broader context of teaching in the school context. Kansanen (2009b, p. 37) suggests a possibility of combining the promising aspects of pedagogical content knowledge and subject-matter didaktik that might lead to new insights in future research. In this chapter issues related to school pedagogy are seen as such issues.

Teaching-Studying-Learning Process

The activities that invite students' knowledge construction in school include teachers' teaching and students' studying. Uljens (1997) argues that both teaching and studying are intentional activities that are directed to promote students' learning. These activities are, however, not necessary prerequisites for learning; students can learn new things without intentional studying or teaching. In addition, teaching and studying cannot guarantee learning. According to Uljens, "Teaching and studying may thus be called activities supporting individual growth through the process of learning. Learning in itself is therefore a process, among others, through which individual growth is achieved. Competence and changes in one's personality may then be called the results of individual growth" (Uljens 1997, p. 40).

Interaction between teacher and students, and among students, is fundamental in teaching. According to Husu, interaction seems to be important for at least two reasons: first, a certain amount of interaction is necessary so that teachers and students can understand each other and perform their teaching and studying activities. Without this basic interactive understanding it would be difficult to know whether teaching and studying activities respectively are focusing in the shared aims that both teachers and students intend. Second, teaching and studying

methods are interactive to varying degrees. They can be interactive in themselves (the discussion method) or they can allow interaction to a lesser degree (methods of student's individual studying) (Husu, 1996, p. 39).

Kansanen talks about indirect interaction that includes the pre-interactive and post-interactive phases that both teachers and students need in order to be prepared for the next instructional situation (Kansanen, 1999). When the teacher prepares for his/her lessons s/he must consider the previous study-history and personal characteristics of the students. Furthermore, s/he must create an appropriate learning environment for a heterogeneous group of students. The students, on the other side, must organize their own study schedules and do their homework.

EDUCATIONAL PURPOSEFULNESS

The goals of education are established in a national curriculum (The National Core Curriculum for the Secondary School, 2003). Both teachers and students should agree on the goals and aims of education to make them meaningful in teaching-studying-learning process. Self-fulfilment is also important part of purposeful education. Waterman (1993) labelled the state of living in which one feels most authentic and alive, i.e., living in accordance with one's diamond, as "personal expressiveness," and suggested that this state is most likely to occur when one is engaged in activities congruent with one's deepest held values and life goals. In this view, it is from the well of the pursuit of self-realization and the fulfilment of one's unique potential that the good life most fruitfully springs.

Purpose is defined as a stable, long-term goal to contribute to the world beyond the self that is also meaningful to the self (Damon, Menon & Bronk, 2003; Damon, 2008). One can identify two kinds of goals in life, one that has as its primary intent the benefit of the world beyond oneself (a purpose), and another that has as its primary intent the benefit of the self (a self-oriented life goal). This conceptualization of purpose extends Frankl's (1988) notions of responsibility and "giving to the world," which emphasize the essential nature of self-transcendent goals toward experiencing purpose in its deepest sense. To this end, a purpose may function not only as a life aim, but as a "moral beacon" which motivates one to commit to and engage in pro-social, generative behaviours in adolescence and the years to follow (Damon, 2008). To live purposefully, one must understand one's purpose(s) in life, plan and be future-oriented, and believe that one has the capacity to achieve one's life goals. Teachers need a sense of purpose to find their work educationally meaningful and also to be able to foster purposefulness in their students.

Teachers' visions or their images of ideal school practices are ways to access teachers' sense of purpose. Vision can provide inspiration and motivation to teachers and also guide them to reflect on their work (Tirri & Husu, 2006; Husu &

Tirri, 2007). According to Darling-Hammond (1990), one of the most powerful predictors of teachers' commitment to teaching is a sense of efficacy, the teachers' sense that he or she is making a positive difference in the lives of their students. In the secondary school context teachers need skills to teach their subject matter in the ways that would open up its educational meaning. The German Didaktik is based on the idea that any given matter can represent many different meanings, and many different matters can open up any given meaning. But there is no matter without meaning, and no meaning without matter (Hopmann, 2007, p. 116). Meaning is what emerges when the content is enacted in a classroom based on the methodological decisions of a teacher. In this process the individual growth of a student is fostered. Hopmann (2007) describes this process in the following ways: "The purpose of teaching and schooling is in this perspective neither to transport knowledge from society to a learner (curriculum), nor a transpositioning of knowledge from science or other domains to the classroom, but rather the use of knowledge as a transformative tool of unfolding the learner's individuality and sociability, in short: the "Bildung" of the learners by teaching" (p. 115).

The German concept of "Bildung" also refers to the holistic aspect of pedagogy. It includes both development of one's talents and abilities as well as development of one's society. Bildung requires a passionate search for continual individual growth and ability to engage in critical development of one's society in order to actualize the highest ideals.

Teachers' Views on the Educational Purposefulness of Their Teaching

In this section we present some examples of teachers' views on the educational purposefulness of their teaching. We use data from secondary school teachers of different subjects (N=19) who have already experienced teaching in school context with different students. The teachers came from two schools in Finland that both emphasized mathematics in their curriculum. The teachers had been interviewed in 2008 and asked to reflect what kind of things they find important in teaching their own subject. More detailed information on this study can be found in Tirri (2011). Another set of data include essays from first year student teachers of different subjects (N=280) who reflected on the educational purposefulness of their teaching in their own subject. The data of this study was gathered in 2010 by the author and is in the process of analysis. In this chapter we take examples from student teachers of mathematics (N=48) and religious education (N=46) to be able to compare them with the examples from teachers of the same subjects in the other study.

General Purposes in Teaching According to Teachers

Teachers of different subjects identified quite similar purposes in their teaching. Ten teachers out of nineteen emphasized the importance of worldview as an educational goal for their teaching. All the teachers wanted to promote a scientific

worldview with basic thinking skills. The teachers wanted to give some basic elements and skills for their students so that they could form their own worldviews. This emphasis was the same for the teachers of both mathematical subjects and teachers of subjects from the humanities. Elsa, a teacher of religious education and philosophy, wanted to advocate global citizenship skills to her students. According to her, independent thinking, argumentation skills and ethical reflection are important skills for students to acquire. She also mentioned tolerance as an important quality she wants to emphasis in her teaching. Philosophy and ethics are both subjects that require mastery of certain concepts before good quality argumentation is possible. The other teachers also emphasized the importance of central concepts in the teaching-studying-learning process. One of the general purposes in teaching in the secondary level is to educate students to master the central concepts of each subjects taught and to be able to discuss these subjects with the help of these concepts.

All the teachers emphasized the importance of teaching at the right ability level of students. The teaching should start from the familiar contents and proceed to the unknown, begin with the simple things and end up with the more complex issues. Teachers' thinking reflected the ideas of finding the "zone of proximal development" identified by Vygotsky (1978).

Teachers with different subjects viewed the social life in schools as very important for the ethos of the school. In both schools the teachers came from, students played chess and music together that contributed to the positive pedagogical environment. Also the teachers co-operated with each other and planned courses together. For example, the teachers in native language and art planned and taught a common course. The teachers also felt that they could share their tiredness and possible stress with each other and support each other in their teaching.

The General Purposes in Teaching According to Student Teachers

The student teachers emphasized the content knowledge of their own subjects as a very important factor in being able to make their teaching educationally purposeful. An interesting observation was that student teachers of both mathematics and religious education viewed subject matter knowledge of their own subject as more important than pedagogical knowledge or pedagogical content knowledge. The following quotes from student teachers are examples of how they emphasized these things in their essays:

> "The core of teachers knowledge is her knowledge of her own subject. The teacher needs to be ready to answer the questions of her students and to acquire new knowledge about the subject. In addition to knowledge of her own subject a teacher of religious education should have a good knowledge base of societal issues and society" (Female student teacher of religious education)

> "I think the knowledge base in mathematics is important because the students don't respect a teacher who doesn't know her own subject well enough" (Female student teacher of mathematics)

In addition to subject-matter knowledge the student teachers viewed the educational role of the teacher as very important. They emphasized pedagogical love from teacher to students as the necessary condition that would make teaching educationally purposeful. They saw the relationship between the teacher and his/her students as the starting point for any meaningful teaching. A respectful and caring learning environment that would meet the needs of different learners was mostly emphasized in the essays. The following quotes demonstrate this tendency of student teachers:

> "In order for my teaching to be educationally purposeful I need to support my students in their growth and personal development not only in knowledge development. I think the most important thing is that the teacher really cares for her students" (Female student teacher of religious education)

> "Education is the main function of the school, and that is why I have the same responsibility as a teacher of mathematics to contribute to the development of the students as all the other teachers. We should educate the students to be rounded, co-operated and just citizens. We should also encourage them to be life-long learners" (Female student teacher of mathematics)

An interesting observation is that practicing teachers of different subjects put an emphasis on students and not that much on themselves. This finding is in accord with theories on teachers' professional development that presents experienced teachers to be more student-centred in their thinking than the beginning teachers (Huberman, 1992). Both practicing teachers and student teachers valued the social and ethical dimensions of education and acknowledged the importance of a positive and supportive learning environment in the teaching-studying-learning process.

Subject-matter Specific Purposes in Teaching According to Teachers

Nine of the practicing teachers taught subjects related to the main interests of the students: mathematics, physics, chemistry, or computer science. Even though these teachers emphasized the holistic nature of teaching, like Mary verbalized: "Teaching is holistic and not only teaching the one subject", they also acknowledged the specific nature of mathematical thinking. In mathematics teaching Jack, who has a long teaching experience of the subject, and who wants to influence people with a strong leadership qualities, wanted to teach students the skills of structures, procedures and abilities with the clear understanding that mathematics is part of the historical heritage of the humankind. According to Jack,

the same things apply to teaching of physics. He also emphasized the importance of practice and concrete skills in doing mathematics. Mathematics is both knowledge and craft and both sides must be present in teaching the subject.

The teachers emphasized the importance of mathematics teaching for the future of the students. They wanted to prepare their students for their future studies at the universities and research centres. They also wanted to give them the skills to compete in national and international competitions in mathematical subjects. According to the teachers their students had already achieved 17 places in the final competitions. This is not a surprise because the students have been selected into their school according to their abilities in mathematics. These students already had the structures, procedures and abilities to do math faster than the average-ability students. In mathematical subjects one way to assess the level of giftedness in the student is the speed in processing the subject matter. One goal of the teachers was to help the students' to understand their level of giftedness and give them possibilities to develop their special strengths. According to Jack the power of community is crucial in developing the strengths of individuals to the maximum level. As an experienced teacher of mathematics and the leader in his own field he guided his students to work in the team and had a clear educational vision and purpose to guide this group to the maximum results and only secondly searched for learning experiences for himself.

The teachers emphasized the importance of the community for the students' personal growth. The following quote is from Kim, who had attended the same school himself and now taught mathematical subjects at his old school

> "The students learn social skills here and find a community with same spirited people. Many of our students have been bullied in their former schools and here they find that they can be themselves in a friendly environment and learn scientific thinking and form scientific worldview without losing their personalities".

Another math teacher, Matt, emphasized that the scientific worldview does not have to contradict the religious worldview, for example.

Subject-matter Specific Purposes in Teaching According to Student Teachers

Student teachers of religious education viewed religion as a very personal subject that required different kinds of personal reflection than many other subjects in schools. They thought that the teacher needs to be aware of his/her own religious identity in order to help the students find theirs. A following quote is a good example of this aspect:

> "The teacher needs to know what he or she believes and who he or she is. In religious education the teachers' role is to guide the students to reflect on different religions and their own Lutheran faith." (Female student teacher of religious education)

The student teachers of mathematics emphasized the ability to meet the needs of different learners in mathematics. They also reflected on gender stereotypes related to their subject. The following quote from a male student teacher is a good example of the challenges related to gender in mathematics teaching:

> "My educational purpose is to advance gender equality and equal rights and tolerance. Mathematics is such a male-dominated field and girls underestimate their potential in mathematics or hide their talent. I need to be aware of these stereotypes in order to provide the same options for boys and girls." (Male student teacher of mathematics)

Another male teacher of mathematics regards the ability of a teacher to meet the needs of different learners as the most important professional skill. Both weak and gifted students should have teaching in mathematics that won't kill their motivation. The student teacher wrote about this aspect in the following ways:

> "The most important professional skill is to meet the needs of different learners. Mathematics is a very sensitive subject, which can expose students to experiences of failing and frustration. We also need to identify and encourage special talent because it is needed in society and we lack experts in the field." (Male student teacher of mathematics)

Both practicing teachers and student teachers of mathematics emphasized the importance of meeting the needs of different learners and especially those of the gifted. The teachers and student teachers of religious education stressed the skills in reflection. According to them the teacher of religious education should be able to reflect her own philosophies and also guide his/her students to reflect on different worldviews.

THE CORE OF SCHOOL PEDAGOGY

In this chapter we have shown that the Finnish research on teaching has a strong value and knowledge base in German tradition with Anglo-American influences. Especially in Finnish teacher education our aim is to educate autonomous, professional teachers who build their practice on research-based knowledge and ethical values. The normative nature and context-dependency of teaching are acknowledged. The teaching-studying-learning process is guided by the national curriculum and it takes place in an institutional context, usually in schools. Teachers need a sense of purpose to find their work educationally meaningful and also to be able to foster purposefulness in their students. According to empirical data presented here both practicing teachers and student teachers emphasize some general purposes in teaching regardless of the subject matter taught. They all view themselves as responsible professionals whose task is to teach the students the basic knowledge of their subject matter. Furthermore, they view themselves

responsible for the holistic education of the students including their personal and ethical growth. The practicing teachers seem to have a stronger emphasis on the students than the student teachers whose main concern is still their own mastery of subject matter and the educational responsibility involved in teaching.

We could also see some subject matter specific purposes in teaching. In this chapter we have presented some differences between mathematics teachers and religious education teachers. The teachers and student teachers of mathematics both emphasized the importance of meeting the needs of different learners, for example, very gifted students and girls. Mathematical thinking can be seen as a basic skill in many sciences and the teachers of this subject wanted to promote this kind of thinking in order to give their students the best chances to succeed in their studies in school and beyond. The teachers of religious education and especially the student teachers in this subject emphasized the personal nature of their subject matter. They viewed that in order to promote educational purposefulness in their field the teacher needs to be aware of his/her own religious identity and mature to discuss different worldviews with the students.

We can conclude that the core of school pedagogy can be found in the purposeful, holistic, normative and context-dependent nature of teaching. Secondary school teaching in Finland requires strong subject-matter knowledge, knowledge of students and the totality of the teaching-studying-learning process. We are fortunate to have teachers of different subjects who can see the educational purposefulness of their teaching and who are committed to practising it.

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PART II THE FOUNDATIONS:

THE DESIGN OF EDUCATIONAL SYSTEM ON VARIOUS LEVELS

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5. STRIVING FOR EDUCATIONAL EQUITY AND EXCELLENCE:

Evaluation and Assessment in Finnish Basic Education

ABSTRACT

In this chapter, we shall provide an introduction to the evaluation and assessment practices in Finnish basic education. We shall highlight the primary premises and goals set for the evaluation work and illuminate its' realization at different levels of the system. Our introduction reveals the holistic development and enhancement function that educational evaluations and assessments play in Finnish basic education. We shall conclude our chapter by outlining the future challenges and developments of Finnish basic education with a special focus on evaluation and assessment.

THE UNIQUENESS OF FINNISH BASIC EDUCATION

Finnish basic education has attracted international interest for over a decade. International comparisons of learning outcomes have ranked Finland among the best performing countries on several occasions, placing Finnish education firmly among the top elite of the world. But what is behind the success? How can we explain these results? Closer investigations of Finnish basic education have revealed intriguing facts about the system and its functioning. For example, unlike in many other countries, in Finland students start school fairly late - at the age of seven- and spend less time at school. The students have fairly little homework and are rarely tested at a national level. In Finland, the schools create their own curriculum based on the national core curriculum. The teaching profession is highly valued and trusted. The teachers are not subjected to evaluations either. All these features highlight the uniqueness of the Finnish basic education system as compared to many other countries. Yet, before making any systematic conclusions about these educational features, it is necessary to understand the systemic whole of the Finnish basic education system and the core elements that contribute to this entity. This is likely

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 69–81.
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to open up new understandings about the core features and functioning of Finnish basic education.

In this chapter, we shall provide an introduction to one of the core elements of Finnish basic education, namely the evaluation and assessment practices. We shall highlight the primary premises and goals set for the evaluation work and illuminate its realization at different levels of the system. Our introduction demonstrates that the evaluation and assessment framework of the Finnish education system stresses the holistic developmental and enhancement function of evaluation. Evaluation is not exercised to control or sanction, but, rather, to develop education at all levels of the system, creating the best learning opportunities for every learner. The nature and function of educational evaluations distinguishes Finland from many other countries. Evaluation may be considered as one of our strengths in maintaining and developing the high standards of the Finnish education system.

EDUCATIONAL EQUITY – THE FOUNDATIONAL VALUE OF FINNISH EDUCATION

The pursuit of educational equity has long been a major goal of the Finnish education system. Creating and maintaining a system of education where all children have equal access to quality education and widely available opportunities to learn to their fullest human potential has been elusive. A strong national vision of the importance of equal basic education is seen as promoting intellectual and social capital as well as prosperity within the whole nation and its individuals. Educational evaluation and assessment work plays an important role in monitoring the realization of educational equity throughout the nation and within and across its districts and municipalities, educational providers and individuals (Atjonen, 2007; Jakku-Sihvonen, 1993; Korkeakoski, & Tynjälä, 2010; Raivola, 2000).

The objective of Finnish basic education is to guarantee sufficient equity in education throughout the country. Equity of education stands for equality of opportunities. A further premise for educational equity is respect for the diversity of individuals. Learners' aptitudes, objectives and educational needs differ and the educational system needs to be able to flexibly respond to these needs. Equal opportunities for education do not mean the same education for everyone, but, rather, equal opportunities to develop one's own aptitudes and personality. Given the educational stratification of diverse students, the implications for equity would suggest the allocation of resources relative to the needs of learners.

Educational equity is supported in Finland in many different ways. The basic prerequisites for students' learning are created by providing education, support and guidance free of charge, offering free school meals, health care, school transport, learning materials and tools, as well as student welfare and other support services. Caring for students in educational and personal terms has become one of the leading educational principles in Finnish basic education alongside ensuring a high-quality curriculum and competent teachers.

Holistic and systemic evaluation and assessment work plays a pivotal role in ensuring the realization of educational equity in Finnish basic education. Nationally defined quality criteria for evaluation, which are based on recent research and evaluation knowledge as well as on national legislation, create a common framework for education professionals and policymakers to monitor and further develop education and its outcomes across the system (Ministry of Education and Culture, 2010; Välijärvi, & Kupari, 2010).

Chelimsky (1997) distinguishes three dimensions in educational evaluation that are shaped by the goals and purposes set for the evaluation work, namely (a) an accountability dimension, (b) a research evidence and data production dimension and (c) a developmental dimension. Evaluations based on accountability aim primarily at providing information to policy makers and education providers about the effectiveness and impacts of education. Evaluations based on data production aim at understanding educational systems and programs. The developmental dimension aims at enhancing the educational system, curricula and teaching methods. It monitors possible changes in educational outcomes, develops indicators for the education sector, and also creates development proposals serving the needs of education providers and developers. The Finnish education system aims to promote all three of these dimensions in its holistic and systemic evaluation and assessment work.

STRIVING TOWARDS EXCELLENCE AND A JOY OF LEARNING: THE FINNISH BASIC EDUCATION SYSTEM

The role of Finnish basic education is to provide students with multiple learning paths that create opportunities to develop skills and competences for lifelong learning and active citizenship. The most essential objective of basic education is to support life-wide and lifelong learning. This means building and reinforcing learning skills and competences as well as providing the motivation for learning (National Board of Education, 2004). Competence is Finland's most important resource and it is imperative to attend to its high standard on a continuous basis. This requires setting objectives for school development that aim at supporting every learner to reach their full potential.

One of the major goals of Finnish basic education is to support the growth and development of every learner, strengthening their operating opportunities and involvement. Learners are seen as individuals whose age and capabilities form the starting points for the provision of education. Learning is defined as being complex, dynamic, linked to human development and embedded within a specific cultural context. A definition of equity should take into account these factors. Equity then could be measured in terms of quality education, care and rigor as well as individual achievement indicators (Raivola, 2000).

The Finnish education system consists of voluntary, one-year-long pre-primary education and a nine year basic education followed by voluntary vocational or

upper secondary education. Higher education is provided by universities and polytechnics. Adult education is available at all levels of the education system. All six-year-olds have the right to free pre-primary education. In 2008, over 99% of six-year-olds participated in pre-primary education (National Board of Education, 2011). Compulsory education begins at the age of seven. The basic education syllabus is nine years, and nearly all children complete their compulsory schooling by attending a comprehensive school. Comprehensive schools can also provide additional basic education: a voluntary 10th grade.

The national core curriculum issued by the Finnish National Board of Education determines the objectives and core contents of different subjects and sets out the principles for student assessment, special needs education, student welfare and guidance counselling. It also defines the principles of a good learning environment, working methods and the concepts of learning (National Board of Education, 2004).

In basic education and upper secondary education the education provider is usually the local education authority and the school draws up its own curriculum within the framework set forth by the national core curriculum. This local curriculum may be devised for the municipality as a whole or for an individual school.

The government defines the minimum number of classroom hours for core subjects in basic education. In Grades 1-6, the content is roughly the same for all students across the country, but a school may focus on subjects in different ways due to the flexible allocation of lesson hours. In Grades 7-9, there are more elective elements in the curriculum. The curriculum also includes a work familiarization period. Students, together with their parents or caretakers, decide which optional subjects made available by the school they should take (National Board of Education, 2004).

THE PREMISES OF EVALUATION AND ASSESSMENT IN FINNISH BASIC EDUCATION

The evaluation of education in Finland is governed by the Basic Education Act (http://www.finlex.fi/fi/laki/kaannokset/1998/en19980628.pdf). The purpose of evaluation is to safeguard the implementation of the Act, to contribute to the development of education and to create favourable conditions for learning. There is a specific decree on the evaluation of education that sets out the following aims for evaluation:

- to provide and analyze evaluation data in support of national decision making on education and as a basis for educational development
- to provide and analyze evaluation data as a basis for local educational development and decision making
- to support learning, the work of school personnel and institutional development

The Ministry of Education and Culture adopts an Evaluation Plan that sets the overall objectives for external evaluation and lists upcoming evaluations

undertaken by the Education Evaluation Council, learning outcome assessments carried out by the National Board of Education and evaluations contracted by the Regional State Administrative Agencies. The plan also contains Finnish Higher Education Evaluation Council evaluations and international evaluations of higher education.

The Regional State Administrative Agencies evaluate the regional availability of education. Education providers have the duty to evaluate the education they provide and its effectiveness. The method of evaluation is not regulated, but the evaluations must be carried out systematically and regularly. Education providers also undergo external evaluations. Each municipality must have an inspection board appointed by the municipal council to evaluate the implementation of the operational and financial aims set by the council (Ministry of Education and Culture, 2011).

The evaluation findings are utilized by the Ministry of Education and Culture in the preparation of legislation and strategies and in financial planning. The National Board of Education applies the evaluation findings to curriculum development and other educational development work. The way in which evaluation data is used by education providers, schools or teachers is not subject to a particular act or decree. This is a matter within the discretion of the education provider, such as decisions concerning educational arrangements overall.

School Assessment

In Finnish basic education, school assessment is based on self-evaluation. Under the current legislation, education providers must assess the quality of the education they provide and participate in external evaluations. In Finland, there is no school inspectorate. This was abolished in 1991. It is up to education providers to decide what they want to review in their internal evaluations and how the findings are reported and published (Ministry of Education and Culture, 2011).

In the year 2010, the Ministry of Education and Culture devised national quality criteria for basic education with a view to facilitate internal assessment and quality enhancement. The criteria focus on:

- leadership
- personnel
- financial resources
- evaluation
- implementation of the curriculum
- teaching arrangements and instruction
- support for learning, growth and well-being
- inclusion and influence
- school-home collaboration
- safe learning environment

The national quality criteria focus on a wide array of elements in the education system and the realization of these elements. The quality criteria aim to promote high-quality education, enrich educational provision and ensure equal educational rights for every learner irrespective of their background. The criteria are also seen as a tool for leadership, which municipalities and schools can monitor and further use to develop their local educational practices in flexible ways (Ministry of Education and Culture, 2010).

Teacher Competencies in Assessing Learning Outcomes

Teacher education and in-service education courses and programs play an important role in providing teachers with skills, knowledge and understanding about educational evaluation and assessment. The initial education for teachers includes modules focusing on student assessment. In addition to introducing research-based knowledge on educational evaluation and student assessment, these modules often utilize national evaluation reports in order to explain the culture of evaluation and assessment within the Finnish education system. The courses and modules on assessment and evaluation also educate future teachers about the ways in which they can use evaluation data in their teaching. The education of future teachers on student assessment varies across teacher education programs, since there is no national curriculum for teacher education in Finland.

The National Board of Education, university continuing education centres and regional authorities arrange short-term programs and training on the assessment and evaluation criteria for education providers.

Teacher Appraisal

Neither teachers nor the instruction are evaluated in Finland. The principal is, however, always the pedagogical leader of the school and, thus, responsible for both the quality of the instruction and teaching staff. Most schools have quality assurance systems that include annual development discussions and/or appraisals.

Teachers' qualification requirements are laid down in a decree (986/1998). The Ministry of Education and Culture monitors teachers' formal qualifications as well as age structure at the national and regional levels by means of triennial data collections. The data is used in foresights and decision-making on teacher education in order to secure the availability of qualified teaching personnel. Participation in continuing professional education is also assessed and the needs for future initial and continuing teacher education programs are identified.

Student Assessment Is Part of Daily Schoolwork

In Finnish basic education, teachers carry out assessments in their respective subjects on the basis of the objectives stated in the curriculum. Assessment is an ongoing part of daily school life. Each student receives a report at least once every school year. In addition, an intermediate report may be given at least once during the school year. Achievement is assessed both continuously and through tests set by teachers. A certificate is awarded when a student has successfully completed the full nine years of comprehensive schooling. An additional certificate is awarded for those completing the optional 10th year (Ministry of Education and Culture, 2011).

In basic education, the assessment is criteria-based. The objectives and core content of instruction are defined in the national core curriculum by subject or a group of subjects. The objectives, core content, descriptions of good performance and the criteria used in the final assessment are determined to help in the assessment. The grade scale is from 4 (weak) to 10 (excellent). The criteria for Grade 8 are defined in the National Core Curriculum for each subject (National Board of Education, 1999).

During particular terms, student assessment is mostly formative in nature. Summative assessments should be used at the end of the school year. The main purpose of the end-of-school summative evaluations is to assess how well the student has attained the aims set out in the curriculum. During basic education, there are no national examinations or compulsory tests. Since 1998, national school performance has been measured by means of sample-based national tests. It is obligatory for all schools in the sample to participate in these tests (National Board of Education, 1999).

Although the main purpose of student assessments is to investigate how well the students have attained the aims set out in the curricula, the feedback must also promote further learning and maintain and enhance motivation for learning. Assessments also provide information about the success of the education in helping students to learn.

Student assessments are often accompanied by authentic and formative assessment methods, such as via students' self-evaluations and learning portfolios (Patton, 1996; Williams, 2010). Students' personal involvement in monitoring their learning practices, processes and achievements has been found valuable in supporting the development of their meta-cognitive awareness and lifelong learning skills. Parental involvement is also welcomed in the monitoring of students' progress and learning. Joint meetings between students, their parents and teachers facilitate collective reflections, during which all parties can document developments and possible challenges in students' learning from their own particular viewpoints.

External National Assessments of Learning Outcomes

The National Board of Education is responsible for national assessments of learning outcomes (National Board of Education, 1999). The purpose is to provide information for the development of education and the core curriculum. National external evaluations are performed according to pre-defined criteria. The information sources, compilation procedures and the methods of analysis are described and justified. The aim is that the information collected is reliable and valid. All assessment projects are carried out and reported as transparently as possible. The salient findings are reported and published in a way that does not do injustice to the individual education provider, the school, the personnel or the students. Ranking lists of schools based on national learning outcome assessment results are practically non-existent in Finland (Simola *et al.,* 2009).

External national assessments are sample-based. The purpose of these assessments is to obtain information for the purpose of educational and curricular development. The overall sample size is 5-10% of the age group, between 3000 to 6000 students. Assessments are usually conducted during Grades 3, 5, 7, and 9, but most commonly in Grade 9, which represents the end of compulsory education (Ministry of Education and Culture, 2011)

The Education Evaluation Plan determines what subjects are evaluated in a given year. Mathematics and the mother tongue (Finnish and Swedish) are assessed systematically. Students' performance in other subjects is assessed at irregular intervals.

External national assessment projects are led by project managers who take responsibility for the entire evaluation process and how it is reported. The method of planning and implementation is quality-assured and fairly similar in all subject-specific assessments. Typically, an assessment process has several phases:

1. Development of instruments
2. Preparation of the sample
3. Pre-test and item analysis
4. Data collection and input
5. Data analysis
6. Feedback to schools
7. National report

The assessment process usually takes 1.5 years.

The purpose of evaluation is to provide information about the state of affairs in schools which can be utilized in decision-making on the development of education at different levels, namely at the level of the school, the municipality, the region and the whole country (Ministry of Education and Culture, 2011).

Evaluations relating to basic education have an important function in ensuring educational equity by determining whether or not students achieve roughly the

same basic competencies regardless of their place of residence, gender and home background. All national assessment reports are submitted to the Parliamentary Education and Culture Committee and to the Ministry of Education and Culture. Seminars are organized for education experts and teachers. Each school in the sample receives its own results and some reference data concerning the whole sample. The education provider (almost always the local authority) receives the same information. School-based reports are delivered to the school as soon as possible, typically within 6-8 weeks of the collection of data. The importance of communicating and disseminating evaluation outcomes among education professionals on a continuous and systematic basis is regarded as pivotal in order to ensure that shortcomings in outcomes are recognized and acted upon (Korkeakoski, & Tynjälä, 2010; Välijärvi, & Kupari, 2010).

CHALLENGES OF FINNISH BASIC EDUCATION

Education plays a key role in building competitiveness and well-being in society. Only through education is it possible to create new high-level competences, which form the foundation for society to continue to develop and prosper. Basic education plays an important role in this development work. Basic education must enable learning and development for entire age groups and encourage them towards lifelong learning in various learning environments. Evaluation and assessment work plays an important role in monitoring the processes and outcomes that support and also challenge the realization of these educational goals (Atjonen, 2007).

In light of current research and national assessment results, Finland also needs to continuously develop its basic education to better respond to the needs of the society and its individuals (National Board of Education, 2011). Recent assessment and follow-up studies have revealed growing differences in learning outcomes, student welfare services, children's and young people's psychosocial welfare and health care services. There are differences between genders, regions and population groups. Based on the research, it is evident that not all Finnish local authorities have sufficient resources or political will to provide high-quality education, which puts students in an unequal position.

The demographic landscape in Finnish basic education schools is clearly becoming more complex. Increasing cultural, linguistic and ethnic diversity among learners makes it timely to re-examine educational equity and its realization in Finnish education. The need to obtain evidence that indicates the degree of equality attained in Finnish schools makes educational evaluation and assessment work extremely valuable for monitoring the situation and adequately responding to the emerging challenges in order to create better learning opportunities that match the needs of diverse learners (Hursh, 2005; Meyer, 2001).

Responding to the Multiple Needs of Diverse Learners

One of the key questions for the development of basic education is how to safeguard encouraging and motivating education for all students. The development of basic education is premised on giving due consideration to students' age and abilities, their individual growth and development, and their different needs. Any possible difficulties should be identified at the earliest possible stage and all students should be supported in a socially empowering way (Liinamo, & Kannas, 1995; Linnakylä, 1993). Student welfare services, social services and mental health services should form an effective whole. School health care needs assistance from an effective adolescent psychiatric service system that provides support for children and young people requiring treatment.

Schools are also expected to motivate and support students more clearly, so as to provide them with opportunities to make the most of their potential as individuals. These objectives can be supported by creating increasingly flexible learning pathways which recognize different learning styles, needs and talents. The right of students to systematic, early and preventive support for learning and schooling was reinforced by a 2010 amendment to the Basic Education Act. Education providers need national guidance in carrying out reforms in order to establish procedures in a consistent manner throughout the country.

Student assessment is one of the most essential issues when developing basic education. Student assessment may be perceived in too narrow of terms as being about examining the outputs of learning and awarding grades. However, the primary role of student assessment is to guide the learning process of learners and to support motivation for learning. Students construct their perceptions of themselves as learners through the feedback received as part of assessment. Experiences of success and finding the joy in learning are important for every student. At the same time, students must also be guaranteed equal treatment in terms of assessment; students showing an equivalent level of competence must be awarded the same grade regardless of location, school and class.

Assessment should support the development of students' learning skills and competences. This requires the development of both the methods of and criteria for student assessment. It is necessary to ensure that assessment criteria and specified objectives are consistently linked to each other. The objectives, in turn, must be formulated in such a way that makes it possible to assess them. Schools need new assessment practices that support the learning process and make use of information and communications technology. These must be consistently supported through national guidance.

STEPS FORWARD IN ENSURING EQUITY AND EXCELLENCE FOR EVERY LEARNER

Developing the best comprehensive school system in the world so that it becomes even better calls for a nationally shared vision on the goal of basic education, its objectives, as well as the implementation and continuous evaluation of development work. It requires securing resources for maintaining and developing the availability and quality of basic education. Success entails determined and persistent leadership and good co-operation at all levels. The development of education should be consistently seen as a development task for the entire education system and as a continuous process. It is not solely determined by degrees. Instead, it should form a natural part of everyday operations within the administration, local educational services and schools.

In order to ensure the integrity of learning, it is essential to determine the key development targets for the education system, which are then pursued through each aspect of the education system. This should be visible throughout the system: in policy decisions (legislation, distribution of lesson-hours), steering documents (National Core Curriculum), funding, teacher education and training and the provision of education and school operations – in the selection of learning environments, the use of various teaching and learning methods, and the forms of guidance as well as in support and evaluation measures. Ensuring the performance of learning outcomes requires stability from the national steering system when pursuing the targets. Legislation, funding and other national steering need to support and steer education providers to carry out statutory and education policy objectives (Lahtinen, & Lankinen, 2010).

The development of basic education needs to continue to recognize the needs and aptitudes of diverse learners. The most essential objective of development is to promote learning and maximize learning outcomes for every student. The curriculum together with educational evaluation and assessment work are key instruments for developing and reforming basic education in Finland. They are the cornerstones of the whole system, through which objectives are refined into steps that guide schoolwork.

Teachers and principals also play an important role in the development and evaluation of basic education; professional competence relating to teaching and management should be constantly supported and consolidated. Building a collaborative culture and developing collaborative competence require attention and effort. Basic education must be developed through partnership and shared leadership. The need for change and the objectives of reform should be understood throughout the system. The prerequisite for achieving the objectives is

commitment from all participants in the education system: national and local administration, schools and teachers. Consistent development of the entire education system, supported by development and enhancement-led evaluation and assessment work, is likely to create education, competences and wellbeing that form the most important resource for Finnish society.

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6. THE FINNISH NATIONAL CORE CURRICULUM:

Structure and Development

ABSTRACT

The national core curriculum as a means for enabling and managing educational change has an important development role in the Finnish school system. In Finland, the national core curriculum is a framework around which local curricula are designed. The national core curriculum contains the objectives and core contents of teaching for all school subjects, and also describes the mission, values, and structure of education. It describes the conception of learning and goals for developing the learning environment, school culture and working methods. This gives the core curriculum a dual role: on one hand it is an administrative steering document, on the other a tool for teachers to develop their own pedagogical praxis. In Finland, development of the core curriculum through a process of collaboration between national and local authorities is a highly developed practice. This has afforded a shift in the focus of curriculum development towards the structure of the curriculum and its pedagogical functionality.
Keywords: curriculum system, curriculum design, curriculum development

MAIN FEATURES OF THE CURRENT CURRICULUM SYSTEM IN FINLAND

In this article, we will introduce the main features of the Finnish national core curriculum for basic education: its essence, structure and implementation. We will also explore current challenges in the curriculum's functionality, and new directions for its continuing development.

The core curriculum has an important role in the Finnish system of school development as a means for enabling and managing educational change. The changes in society and its values will not be able to establish a constant position in schools, if they do not permeate the curriculum. The curriculum is essential to every educational reform: innovations in science, technology and education will

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 83–96.
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only bear fruit if they are embedded in curriculum guidance. We argue that this is the only way that they can especially reach teachers and all the other important educational actors. The current curriculum system in Finland is based on three essential ideas:

- management by goals given in legislation and in the national core curriculum
- autonomy of municipal authorities in providing and organizing education: local curriculum as a steering document at local level
- utilization of teachers as valued experts who develop the school-based curriculum as a source for different approaches to schoolwork (The Finnish National Board of Education, 2011).

In Finland, the national core curriculum is a framework for making local curricula. It determines a common structure and basic guidelines that the local curriculum makers, school officials and teachers, use in order to build a local, context driven curriculum. The National Core Curriculum has two parts. It includes the objectives and core contents of teaching for all school subjects, also describes the mission, values, and structure of education. It also describes the conception of learning and goals for developing the learning environment, school culture and working methods (The Finnish National Board of Education, 2011). This gives the core curriculum a dual role: on one hand it is an administrative steering document, on the other a tool for teachers to develop their own pedagogical praxis. This dual role makes the development of the curriculum structure challenging.

The Finnish national core curriculum is a fairly new invention, which has only been in place for the past forty years. Before 1970 Finland had two parallel education systems, which placed children on different educational routes at an early age. This division had a strong connection to the socio-economical background of the children and resulted in inequality of learning opportunities and an achievement gap between different groups. A long politically heated debate preceded the 1968 Basic Education Act, which stated that all children should attend the same school for the first nine years of education. The foundation for Finnish basic education was born. The national implementation of this comprehensive school reform began in 1972 in the northern parts of Finland. By 1976 the reform had reached the municipalities in the southern parts of the country (The Finnish National Board of Education, 2010).

The first national curriculum was published in 1970 and it was a strongly centralized document. The curriculum was first reformed in 1985 after the 1983 Basic Education Act, and a direction to decentralization and teacher autonomy was set. Before 1985 streaming was the usual practice in schools, a vestige from the time of two parallel education systems. The curriculum reform discontinued this practice and set higher standards for all students. Municipalities were given more decision-making powers, and individual student needs became the focus point of education.

The decentralization process continued during the 1990s. The curriculum reform of 1994 gave the municipalities' local authorities a large degree of autonomy. The rights of local authorities were set in the steering system. Previously all textbooks had been inspected, and schools where regularly visited by school inspectors, but these practices were abolished. Being the primary educational provider, municipalities were given the right to freely determine how they wished to use state provided financial grants. Local authorities received autonomy to organize schools, education process and funding. School based decision-making became a central part of formulating curriculum.

In 1998 a total reform of educational legislation followed. The emphasis was set on goals, pupil rights and duties (The Finnish National Board of Education, 2010). Evaluation was emphasized: thematic reviews and national testing was put in place. This testing was based on sampling and its purpose was to obtain an idea of national learning outcomes. However, there has never been a comprehensive national testing system for all students. The 2004 curriculum reform was consequently more centralized. The national core curriculum is a normative document, which emphasizes national decision-making and narrows down differences in local implementation. Also, for the first time, national criteria for student assessment were introduced (The Finnish National Board of Education, 2004).

Currently, the debate on the future of the national core curriculum is focused on its educational aims and pedagogical elements. The challenge of the contemporary curriculum is that it needs to correspond to the evolving conceptions of knowledge and learning. Thus the curriculum must be restructured so that it supports the learning process of 21st century learners. This can be achieved with a better implementation of interdisciplinary pedagogy and higher skills in the curriculum.

The Steering System of Basic Education

The core curriculum of basic education in Finland cannot be discussed without discussing the steering system behind it. The curriculum is an educational tool shaped by the decision making of many different administrative levels. Firstly, the curriculum functions as a part of the steering system of education. Secondly, it has a pedagogical function, serving as a guiding document for educators, especially for the teachers themselves.

The steering system of basic education has multiple hierarchical levels. The foundation of the Finnish educational steering system is the Basic Education Act and decrees. The Council of State determines the general goals of education and the time allocations for various subjects. The National Board of Education develops the national curriculum, which outlines the local curricula. (The Finnish National Board of Education, 2006). In Finland education providers form their own local curriculum. This might be a joint curriculum for all schools in the

municipality area or schools might form their own curricula, which are then approved by the school officials of the municipality. Municipalities and schools are granted great autonomy in organizing education and implementing the core curriculum. (Halinen & Järvinen, 2008). This is to ensure freedom to make individual choices based on the local needs of different schools, with the core curriculum serving as a common national basis. Local decision-making is also seen as a means of increasing local officials' and teachers' commitment to the implementation of the curriculum. Their active involvement in the process and therefore their ownership of the curriculum is reinforced by the autonomy and freedom they are afforded.

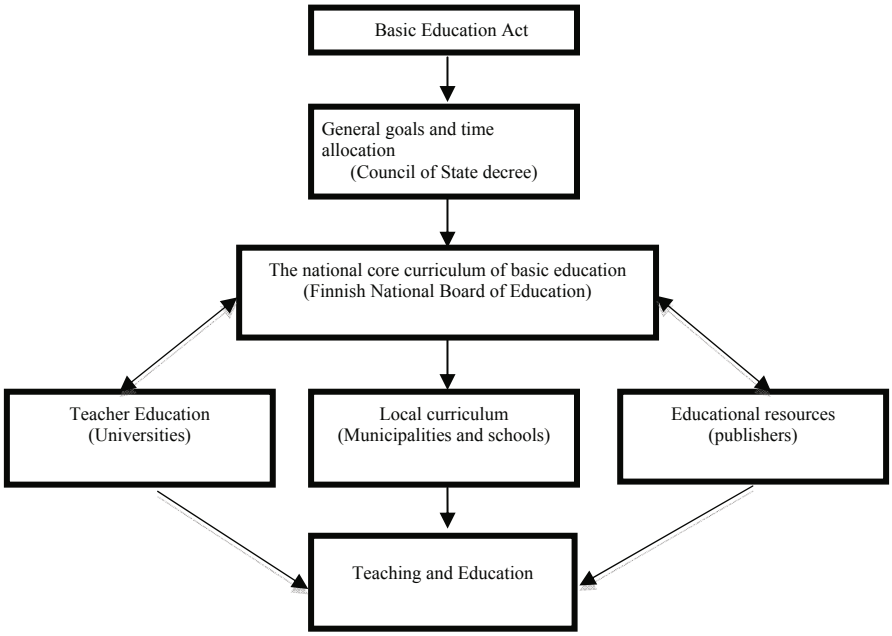

Figure 1: The steering system of basic education.

In addition to the curriculum, educational recourses shape teaching and education in schools (Uusikylä & Kansanen, 1988). Textbooks and other materials produced by private publishers have a strong effect on teaching and learning (Heinonen, 2005). In Finland textbooks and other learning materials are not authorized by the government. Previously, the National Board of Education approved all textbooks, but now private publishers independently interpret curricula into educational recourses. This is the only aspect of the educational steering system, which is not governed or financed by a public organization.

The curriculum process is a product of the steering system. When the national core curriculum finally reaches local authorities it has gone through several levels of administrative work. The process of making the national core curriculum is a democratically structured and hierarchical one. Still, this is not a process purely governed by administrators. Educational professionals, parents and a wide range of society interest groups are consulted and their views are taken into account in the process. In recent reforms (in 1994 and 2004) the Finnish national core curriculum has been the result of a cooperative effort between a broad network of administrators, unions, education providers and schools. Network collaboration has been a means of increasing the ownership of education providers and schools in the curriculum process. This consensus policy has been a successful effort. Finland has well functioning practices and a strong working tradition of reforming curricula, and this is seen through the involved curriculum process. Developing and establishing structures for collaboration has been a central part of this. Collaboration between national curriculum authorities and local administrators has been a functioning practice for several decades.

Development of the curriculum through a process of collaboration between national and local authorities is already a highly developed practice. This has afforded a shift in the focus of curriculum development towards the structure of the curriculum and its pedagogical functionality, areas that affect the organization of the curriculum process both locally and nationally. In the past, curriculum design was mainly based on the work of subject specialist groups, which in part has led to the fragmentation of the national curriculum. A lack of a clear set of shared approaches to reach educational aims has been a characterizing quality of the national core curriculum. Next, our focus will be on the challenges of curriculum structure and curriculum development.

THE STRUCTURE OF THE FINNISH NATIONAL CURRICULUM

The Functions of Finnish Curriculum

As an educational steering document the Finnish curriculum has three main functions. It is:

1. AN ADMINISTRATIVE DOCUMENT
- Part of the national steering system of education
- Part of international co-operation and development

2. AN INTELLECTUAL DOCUMENT
- Defines and recreates knowledge that is culturally significant
- Reveals current conceptions of knowledge

3. A PEDAGOGICAL DOCUMENT
- A tool for teachers
- Provides pedagogical advice and support
- Sets guidelines for teaching and learning

It is obvious that the Finnish national core curriculum (2004) is a document that gives firm guidance. This is justified by the need for national unity, equity, and the basic right to education (The Finnish National Board of Education, 2006). The national curriculum has been a means of distributing clearer guidance on a national level. It follows that the curriculum has become more precise and detailed. All central aspects of teaching and education, including guiding principles and central content, have been explicitly defined.

As an administrative document, the curriculum has a strong judicial remit. The founding of the Finnish comprehensive school in the 1970s was based on the idea of equality. The whole nation is entitled to quality basic education. This principle has guided school development ever since. The aim has been that regardless of where you live, everyone is entitled to have the same education (Lampinen, 1998; Somerkivi, 1982). This requirement for equality has set clear directions for national curriculum development. As part of the steering system of education the national curriculum has been precisely aimed at building equal comprehensive schools throughout the nation. This has meant that in practice the curriculum has been controlled through a centralized system of administrators. This centralized control has been strong in the last decades, apart from a short neoliberal sprint in the 1990s, when schools were given the liberty to determine their curricula quite freely (Volanen, 2001). The current curriculum encompasses both a strong idea of individuality and pedagogical freedom, and the need for equal basic education that requires a strong centrally controlled curriculum.

In addition to its pedagogical function the national curriculum also has an intellectual function (Antikainen *et al.*, 2003). There is a specific understanding of knowledge and learning embedded in the curriculum, and this is largely unquestioned. This understanding defines what is culturally important. In recent years technological innovations have revolutionized the meaning of information and knowledge for society and its citizens. Hence knowledge, which is deemed culturally valuable, has also undergone a profound change, but the national curriculum has yet to follow.

In Finland, the current approach for organizing teaching and learning is clearly subject-based, which means that the national core curriculum defines general aims, contents and specific assessment criteria for each school subject separately. The Finnish curriculum is highly academic in nature, which is illustrated by the fact that there are 18 different subjects included in it. The continual increase in subject contents in the curriculum has led to a justified criticism of the curriculum being too information-oriented and fragmented (Sulonen *et al*., 2010).

The curriculum, at its core, functions as a pedagogical guiding document (Vitikka, 2004). The curriculum entails assumptions and expressions of knowledge and skills, learning and the learning environment, as well as different work practices. It determines the aims and assessment criteria of learning, which form

the bases of the teaching process. New directions in research and educational innovation are filtered into teaching and learning through curriculum development. The curriculum is a way of distributing information concerning the latest perspectives on teaching, learning and guiding the learning process of pupils. It is a tool for developing teachers' pedagogical thinking and forming their own pedagogical praxis. The curriculum is also the basis of the school community's shared understanding of how content should be organized and what pedagogical devices are necessary in order to reach educational aims. This may seem to be conflict with teachers' pedagogical freedoms, yet the opposite is true. At best the curriculum provides teachers and school communities with tools to build and renew pedagogical practices (Vitikka & Krokfors, 2010).

The Pedagogical and Ideological Background of Finnish Curriculum Design

As part of the national steering system of basic education, the design of the curriculum defines and frames the content and pedagogy in basic education. When designing curricula, choices have to be made between the different elements. The essential difference in curriculum design is the relationship between aims and content. This relationship shapes the curriculum as a whole. From a historical perspective, the essence of the Finnish curriculum can be traced to two very different didactic schools, much like the curricula of other Nordic countries and Germany (Autio, 2002, 2006; Gundem & Hopman, 1998; Kansanen, 1990; Malinen, 1977). Firstly, the Finnish curriculum owes much to German didactics and the so-called Herbart-approach. This school of thought with its concept of "Lehrplan" was introduced into Finnish discussion in the early 1930s (Kansanen, 1990; 1995; Siljander, 2002). The Herbart school focused on content as the centre of teaching and learning, which led to a subject-based approach to education. Secondly the North American school of thought affected the Finnish curriculum in the 1960s by bringing Dewey and his concept of curriculum into the Finnish educational literature. This view of curriculum stated that the curriculum should be organized around more child centred and comprehensive goals, and mere subject matter could not be the centre of learning when organizing the learning experiences of younger children.

The introduction of curriculum thinking happened at a time when the content of the Finnish curriculum was deemed in need of reform (Kansanen, 1990). It followed that the curriculum-perspective inspired wide discussion of the content of education and the social meaning of schooling. Instead of teaching and content, learning became the focal point of education. This meant that in addition to subject specific goals, the curriculum also included wider learning goals, *i.e.*, learning outcomes. Still today, this dual structure is the basis of Finnish curriculum design.

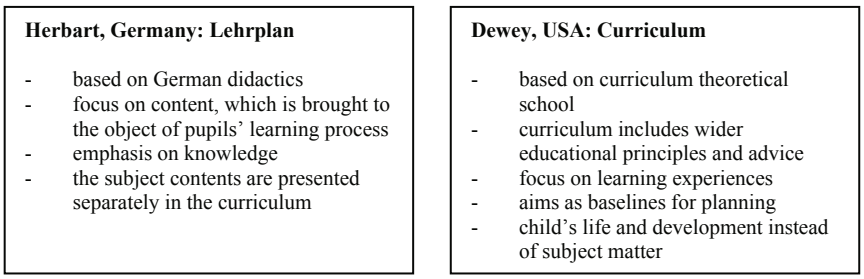

Figure 2. Two traditions of the curriculum.

In practice the dual structure has become a discussion about integrated curricula and subject-based curricula. Maybe because of our parallel tradition of schooling before comprehensive school, curriculum reform in Finland has always been a debate about whether the core curriculum should be subject oriented or a more integrated view on teaching and learning. This balance between two different traditions is also at the centre of curriculum design internationally. When writing a curriculum the result is always a compromise between subject sciences and student needs.

The latest shift in curriculum development has been the redefinition of educational aims from fragmented subjects towards competences (Ministry of Education and Culture, 2010). Traditionally the Finnish curriculum design for comprehensive school has represented a subject-based approach, but the exponential increase of knowledge, the ever more prominent role of technology, and social changes have created a demand for new kinds of skills. Future curriculum reforms must take these new conditions into account.

The role of competencies and skills as the central aims of the curriculum is at the heart of curriculum development. Curriculum design is always based on certain ideologies, which define teaching and learning. Saylor, Alexander and Lewis (1981) introduce one possible ideological division. They suggest that curricula can be divided into four basic designs that each reflects a unique ideology (Saylor *et al*., 1981; McKernan, 2008; McNeil, 1985; Schiro, 2008). In the field of curriculum design these types rarely exist as such, rather they characterize the principal idea, which the curriculum is based on.

Table 1: Curriculum designs according to Saylor (1981).

Curriculum design	Subject matter/disciplines	Specific Competencies	Social Functions	Individual needs and interests
Source for goals and objectives	Subject matter to be learned	Competencies to be acquired	Needs of society	Needs and interests of the learner

In subject-based curricula the bases for aims and content come from the discipline, therefore mastering the subject specific content becomes the central goal of learning (Pinar, 1995; McKernan, 2008). The competence-based curriculum highlights skills and competences deemed central by society. The curriculum defines the skills and knowledge needed to attain these competences, which are also the bases for forming aims and content. (Saylor *et al.*, 1981). The aims and content of a curriculum based on social functions are determined by social needs and problems. Socially relevant issues always find their way into the curriculum, one way or the other (Kansanen, 2004; Saylor *et al.*, 1981). The learner-centred curriculum is about the needs of individual learners, which defines its content and aims. The learner-centred curriculum includes information on the interests and needs of certain age groups, as well as individual students (Saylor *et al*., 1981).

The subject-based curriculum stresses both the aims and content that are associated with disciplines, whereas the competence-based curriculum is structured primarily on skills, making discipline content and aims secondary. Moving from a subject-based curriculum to a competence-based curriculum requires changes to be made throughout the whole education system, most notably to teacher education.

The Need for Coherence between Aims, Contents and Practices

As we have previously stated in this article, the Finnish curriculum is seen not only as a national steering instrument, but also a pedagogical tool, a direction towards which the curriculum is also continuously developing. The curriculum's part in school development is dependent on the meaning teachers give to it as a regulator of their work. In Finland, one goal of the curriculum reforms has been to change teachers' curriculum thinking and deepen their commitment to it. The meaning of a curriculum in teaching and school pedagogy has not always been self-evident (Kosunen, 1994). Teachers need clearer guidance on how to plan and develop teaching in line with educational goals. The curriculum should be a meaningful, relevant and a clear entirety that supports teachers' work, and provide space for students and teachers to develop their own pedagogy.

The curriculum is meant to function as a teachers' tool and thus it is essential that it is coherent, whatever its design or pedagogical background. In a curriculum, like in any plan, the goals, substance and details of the action must be clear (Foshay, 2000). In Finnish curriculum thinking, the structure of the curriculum, has traditionally, been understood as a one-dimensional chronological text comprised of separate elements. Subject matter is perceived as separate sections, even as kinds of miniature curricula within the curriculum. In Finnish curriculum development there is an on-going debate about the need for structuring the national core curriculum as a coherent model where each dimension of teaching is in

balance. It is a challenge to write the curriculum so that educational starting points permeate the subject matter systematically. This is a challenge with which we have yet to succeed.

Instead of a chronological construct made of separate elements, the curriculum must be viewed as a three-dimensional matrix (Foshay, 2000) or as a cube that brings the different levels and aspects of the curriculum together and depicts them as one entity. The curriculum is easier to comprehend through this three-dimensional model, which highlights the unique shape and function of different sections. This meta-level structure can, at its best, create a common base for curriculum thinking and the central concepts of the curriculum.

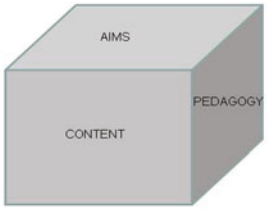

Figure 3: The curriculum as a whole: aims, content and pedagogy.

The cube model depicts the three central aspects of curriculum: aims, content and practice. Formal education always has certain aims, content and a clear form. Curriculum development is actually the act of redefining these three basic elements (Bernstein, 1975). Curriculum development must focus systematically on all three aspects in order to create a balanced reform. The relationship between aims, contents and pedagogical principles needs to be clear in order to create an inner coherence in a curriculum. This applies, not only to the relationship between the educational starting points and subjects, but also to coherence between and within subjects. In order to broaden curriculum thinking, it is necessary to perceive a curriculum as a framework that binds aims, content and pedagogy into a seamless whole. The systematic organization and depiction of these elements would enable inner and outer integrity in school education.

THE FINNISH CURRICULUM IN AN INTERNATIONAL PERSPECTIVE

A national curriculum in its essence is a means of social and cultural reproduction (Lundgren, 2006), and as such cannot be taken out of the national context it is applied to. Each country has its own cultural identity, value system and educational content that are deemed valuable, even irreplaceable. This cultural content is transferred to the next generations as a self-evident part of education. National curricula both pass on this cultural knowledge and reinvent it. These cultural values determine the functions of a curriculum.

No curriculum can be developed in a void. In recent years it seems that curricula have not only been shaped by national culture, but more and more by global discussion and comparisons. The interest in global evaluation of schooling, such as PISA, has been based on a notion that there is a best practice that can be copied and transferred to different cultural contexts. Curriculum study has not received much attention in these comparative studies, yet the curriculum is a fundamental guiding document and a central part of the steering system of education. In reality there is no single best educational system or curriculum model that automatically results in higher student learning. The curricula of the most successful PISA countries differ largely in content and design (Anderson-Levitt, 2008). Still there are common factors to be found (Darling-Hammond, 2010).

There are two central, globally shared directions curricula seem to be developing to; national curricula are at the same time beginning to resemble one another more and at the same time to differentiate from each other. It seems that the matter of subject, content and skills is globally agreed on, and when different curricula are compared it can be seen that they are developing in the same direction (Vitikka & Hurmerinta, 2011). At the same time, curricula are differentiating in the implementation of their most central function, guidance. When searching for success stories or best practices, this might be the one thing that can "make or break" curricula.

The subjects taught in schools are widely agreed on globally (Vitikka & Hurmerinta, 2011). Historically, languages, mathematics and social studies have been part of the 'global-curricula' since the beginning of the 20th century. Time allocation and central content in these subjects entail remarkably little variation. Art and physical education became common after the Second World War and the natural sciences boomed in the 70's and 80's. (Meyer, Kamens & Benavot, 1992).

Subjects and subject content is not the only bridge between different curricula. In recent years a growing trend is to focus on the different skills global citizens require. In Anglo-American countries basic skills have been objects of discussion since the 1970s (Franklin & Johnson, 2008). Basic skills include reading, writing and mathematics, i.e. literacy and numeracy. In recent years this thinking has been taken further. The trend seems to be that the curriculum should entail practical skills and higher skills, such as the skills of thinking and application. The quality of these higher skills is widely agreed upon (Vitikka & Hurmerinta, 2011).

It seems that the pedagogical functions of the curriculum contain most national and local variation (Vitikka & Hurmerinta, 2011). Curriculum guidance is multiform in different curricula and is based on cultural knowledge, national educational policy and tradition. Questions of teacher autonomy vary between countries. Finland is known for its high level teacher education and teachers are trusted educational professionals who play a central role in curriculum development. This has meant that teachers have been awarded pedagogical freedom in choosing their materials and methods, and curriculum guidance has been more focused on content and aims.

Student assessment often seems to be a source of controversy in curriculum development. Globally, student assessment is a question between teacher autonomy and external evaluation: nationally standardized tests are widely in use as evaluative tools in many countries seeking to fortify national control. The common factor between successful PISA countries, such as Finland, Singapore and South Korea, is that they do not use standardized tests to stream their students in a way that limits their access to secondary education (Darling-Hammond, 2010). In Finland national testing is only used as a diagnostic tool, and has no implications for individual students or teachers.

Student assessment in a curriculum can be viewed as two-dimensional. On one hand the curriculum defines the principles and pedagogy of assessment, on the other hand it defines standards, which are the assessment criteria for learning outcomes. In Finland the emphasis is on the pedagogy of assessment. Standards were first introduced in the latest national core curriculum (The Finnish National Board of Education, 2004) and they are still loose when compared to those of other nations (Vitikka & Hurmerinta, 2011).

The rationalization of international comparative studies has been to find the best possible curriculum – yet the idea of a universal curriculum has been generally rejected. A national curriculum is a deeply national and cultural interpretation of knowledge, learning and education and as such cannot be transferred to another cultural context. Therefore the greatest gain in comparing well functioning curricula lies in the development of national curriculum thinking. This should be kept in mind when examining the possibility of a global curriculum. Different models and new interpretations can produce meaningful national innovations. Global collaboration and discussion can produce shared development and progress.

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RIITTA JYRHÄMÄ & KATRIINA MAARANEN

7. RESEARCH-ORIENTATION IN A TEACHER'S WORK

ABSTRACT

Finnish teacher education is research-based and all teachers are educated to the master's level. Every teacher also writes a Master's Thesis, as part of their studies. During the education, we emphasize the importance of teacher's pedagogical thinking, personal practical theory, reflection, and inquiry-orientation, and these are also practised in many ways during theoretical as well as practical studies. But how are the skills provided by this research-based teacher education realized in a teacher's work? What does inquiry-orientation mean in reality? What do the teachers do when they 'research their own work', or the community is committed to inquiry-orientation? We asked 135 teachers these questions. We wanted to know specifically what they understand by inquiry-orientation, how it is realized in an individual teacher's work, and how it is realized in the school community. The responses were very multifaceted, and it became clear that the teachers understood inquiry-orientation to be a complex phenomenon. It was seen, for example, as everyday work, where a teacher develops and educates him/herself. It also meant reflection, doing things in another (new) way, getting feedback, and using inquiry as a method of teaching.
Key words: research orientation, teacher's work

INTRODUCTION

The aim of the Finnish teacher education is to educate inquiry-oriented teachers; this is stated in many publications (e.g. Jakku-Sihvonen & Niemi, 2006; 2007). Research-based teacher education is based on the teacher's pedagogical thinking, that is, how a teacher thinks and makes decisions, and, particularly, how the teacher justifies these (Kansanen, 2006; Kansanen, Tirri, Meri, Krokfors, Husu, & Jyrhämä, 2000). The transformation took place at the time teacher education was made the responsibility of universities along with the change to a knowledge society – in other words the need to be able to find and apply information. Regarding teachers, these ideas produced the need to be able to 'read' the scientific literature. In an every-day work this means that teachers should be capable of

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 97–112.
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analysing and assessing their own work, and developing their work alone as well as with others. Especially reflection and the development of cognitive and metacognitive skills are important considerations for managing the changing demands, environments and surroundings of today's teacher's work.

Being an inquiry-oriented teacher is considered to mean that the teacher can integrate theoretical and practical knowledge, and based on them, form a continually developing personal practical theory. Thus research orientation needs to be understood as a way of working and thinking rather than merely producing research. "Research orientation" as well as "the academic nature of teacher education" are well known slogans for our graduates. But how are they understood concretely? What do these slogans mean to teacher educators or teachers?

TEACHING IN FINNISH SCHOOLS

Statistics of Schooling in Finland

School work is regulated by the laws of Finland. For example, the Basic Education Act (628/1998) states that first and foremost pupils should attend the neighbourhood school that is the closest to their homes. The Basic Education Act also states the length of the school year, which is 190 days. The law (amendments) also determines the length of the school day for pupils; in kindergarten and first and second grades the school day may not be longer than five hours, and for the older pupils (grades 3–9), the school day may last up to seven hours. One hour means 45 minutes, but "hours" are grouped together to form longer teaching periods.

The teachers' working days are longer than the pupils'. The primary school teachers arrange divided group teaching, so that only half of the class is present at a certain time. Primary school teachers may also teach some subjects to other classes, especially if they are specialized in certain subject(s). Teachers' weekly teaching hours vary between teacher categories and subjects. These hours are determined in negotiations between the teacher union and the employer's representatives, and they are stated in collective bargaining contract. The weekly teaching hours are shown in the following table (Table 1). Teachers do not have hours set aside for planning or evaluation, like in some other countries. The average working week in Finland for many occupations as well as professions is 38 hours. This is also what is considered an approximate total of weekly working hours for teachers, although, it is not determined specifically, neither is it monitored in any way.

Table 1. Finnish teachers' weekly teaching hours (OVTES 2010–2011)

Teacher category	Hours/week
K–6 teachers (primary)	
Kindergarten teacher	23
Class teacher (primary teacher)	24
Special education teacher (K–12)	24
Special education class teacher	22
Subject teachers	
Mother tongue teacher (Finnish/Swedish)	18
Second official language teacher (Swedish/ Finnish)	20
Mathematics, physics, chemistry, ICT, arts, music teacher	21
Religion, ethics, philosophy, history, social sciences, home economics, health education, biology, geography teacher	23
Crafts, physical education, student counselling teacher	24
Other	23

The average classroom sizes (19.8 pupils) in Finland are a little bit smaller than the average size in the OECD countries (21.6 pupils). In the upper comprehensive school, the difference is even greater, in Finland there are 20.1 pupils per class, whereas the average for the OECD countries is 23.9 pupils per class. (OECD, 2010.)

The Everyday Life of a Finnish Teacher

The fundamental task of a teacher naturally is teaching. The lessons, however, are only the visible part of a teacher's everyday life: prior to the contact hours, lessons are planned, and after classes, they are evaluated, followed by planning the next lessons. Teachers, especially in primary schools, are in close contact with parents, as well as cooperating intensively with other teachers and other school personnel. Besides those contacts, the teachers create relationships outside of school, depending on the surroundings and possibilities of that particular area.

The traditional idea of a teacher was that the teachers were "the heart of the village", the appreciated disseminators of knowledge to the entire community. From those times, society has changed to become much more complex. However, in Finland, what has remained from those times is an appreciation of teachers. This is shown clearly when appreciations of different professions are compared. It is very interesting to look at a survey conducted by one of the biggest Finnish periodicals, Suomen Kuvalehti (The Finnish News Magazine), on how various occupations are valued. These kinds of surveys have been carried out for several years.

Table 2. The appreciation of certain occupations in Finnish society (Suomen Kuvalehti, 2004; 2007)

Profession	2004 (380 professions)	2007 (381 professions)
Surgeon	1	1
Fireman	5	2
Nurse	9	6
Special needs teacher	23	21
Kindergarten teacher	34	22
Speech therapist	27	28
Psychologist	31	33
Professor	33	41
Class (primary) teacher	46	40
Subject teacher	72	66
Salesman (door-to-door)	380	381

It is quite clear that Finns appreciate occupations in the area of health care. Appreciation of the teaching professions is also evident in Table 2. From the different kinds of teachers, special needs teachers, kindergarten teachers and speech therapists rank higher than class teachers and subject teachers. These highly appreciated variations of teaching are most likely associated with the same kinds of characteristics seen in health care or in the occupation of fireman. The common denominator might be helping other people and peaceful living in a safe society.

Teacher education provides the teachers with a very good theoretical basis, but it seems that the beginning of their careers is still very demanding. Especially in the early years, the challenges that the novices face are difficult. Most of the feelings that the novices have during the first year are negative (Blomberg, 2008). It is also a fact that in Finland, approximately 5–10% of new teachers leave the teaching professional during their first 2–5 years. Although new teachers of some school communities are supported through peer mentoring which offers a possibility to discuss work with teachers in the same phase of their teaching careers, the support provided may still not be enough.

Many changes have taken place in the teachers' work during the last decades in Finland. More and more teachers have other duties besides teaching. They need to be able to differentiate between their skills even more, due to two facts. The first fact is the increasing number of pupils that need special education. The other is a new law that guides teachers very clearly in dealing with students who may have special needs. The law has a concrete effect towards more inclusive and integrated schooling. Children who have special needs attend neighbourhood schools, i.e., the ones closest to their homes, and they are, if possible, included in the regular classroom activities, but provided with a special learning plan, or an aid. This poses new challenges to teachers.

For a teacher's survival, personal characteristics play an important role, but besides them, interactive skills, a positive attitude, professional identity, creativity and self-reliance are important. The work organization can promote teachers' survival through communality, a clear and functioning culture of collaboration and induction for new teachers. (Aho, 2011.)

TOWARDS INQUIRY-ORIENTED TEACHING

As mentioned already, Finnish teachers are educated for inquiry-orientation. The aims are also for a high quality academic content knowledge as well as pedagogical content knowledge, besides meta-level knowledge for example of different learning theories.

Future teachers are also expected to internalize the rules of social and moral conduct. Further on, it is thought that the pedagogical skills as well as the ability to reflect act as bridges between academic and professional development. (Niemi & Jakku-Sihvonen, 2006, pp. 40–45.)

During teacher education teaching practice is the course closest to the actual teacher's work. In these practicum periods, the candidates, in fact, practise analysing and examining the act of teaching. The connecting of school pedagogy and university pedagogy brings along both, the academic, as well as professional viewpoints of the work. Also the dialogic method of supervising the teaching practice together with peer students as well as mentors emphasizes its inquiry-orientation. (see, Jyrhämä, 2006).

The Teachers' Conceptions of Research-Orientation

We asked teachers to define what research-, or rather, inquiry-orientation means to them in their everyday work. We received answers from 135 teachers altogether in two phases. Firstly, we reached 31 teachers through a web-based survey, of which 16 were primary school teachers, and 15 were subject teachers in secondary schools. All of the teachers worked in university partnership schools and have acted as teaching practice mentors for student teachers. The teachers gave their opinions about inquiry-orientation in their work as well as in the community's seervice. Secondly we collected handwritten definitions of inquiry-orientation from 104 teachers, who participated in a mentor course. Of this group, 34 teachers were primary school teachers, and 70 were subject teachers in secondary schools or in adult education. We describe below what the Finnish teachers thought about inquiry-orientation in their work and the school community.

Inquiry-orientation in an Individual Teacher's Work

Based on the answers, the teachers think that inquiry-orientation is in an individual's everyday work, most of all, this means that the teacher develops as a

teacher, and tries to educate him/herself. They considered it to mean, for example, bringing new issues to the school life, being an active developer, or aiming to improve teaching. Later, they mentioned issues such as an interest in educational research, documenting work, changing operating procedures if needed, conducting sociograms of the classroom's social relationships, as well as educating one's self and reading the literature.

> Inquiry-orientation in a teacher's daily work is shown as an all round interest towards developing one's professionalism. It is necessary to learn new things and continuously develop one's teaching. An inquiry-oriented teacher is eager to investigate the subject matter from many viewpoints. (Home-economics teacher, female)

> An inquiry-oriented teacher wants to find out about things and is willing to professionally develop in his/her work. (Subject teacher, female)

They also consider evaluating one's own action as important, more specifically, analysing one's own failures, or reflecting on issues that need to be changed. They also mentioned thinking together with students about why something did not work. They stated that justifying one's action is part of an inquiry-orientation, as well as constructing a memo or a portfolio of one's experiences.

> An inquiry-oriented teacher is courageous enough to break routines. This includes the ability to analyse different classroom or learning situations, and develop them further for example, based on the feedback from students (e.g. test results, the acquisition of information, learning of basic skills). (Home economics teachers, female)

> Boldness to change something that does not work with reflection on one's work as a basis. (Subject teacher, female)

> The teacher reflects on his/her own work continuously, and wonders, how things could be done differently. The teacher discusses about teaching and class situations also with colleagues, and takes advantage of peer support. A teacher can also ask for feedback from students. She/he could think with the students, for example, if some method did not work as well as was hoped for. (Subject teacher, female)

A constructivist view of teaching was also one viewpoint of inquiry-orientation that they brought up. They thought that their responsibility was to guide students to the sources of knowledge, instead of giving them ready made answers. According to the teachers, teachers need to teach their students how to look for information, as well as approach new topics with a questioning attitude. They also mentioned student centred teaching as belonging to the inquiry-orientation.

> Inquiry-orientation in my opinion is that issues are investigated with curiosity. Asking questions and seeing problems are an integral part of learning. Not so much just the answers. (Subject teacher, female)

The teachers also thought that multiple methods in teaching were part of inquiry-orientation. This did not only mean doing experiments or inquiries in the classroom (which was also one aspect of inquiry-orientation), but more general varieties of teaching methods and styles, for example field trips.

> The teacher develops and thinks about different methods for teaching, so that the teaching would be suitable for each student, and appropriate for his/her level. The teacher needs to keep up with modern times. (Home economics teacher, female)

> Inquiry-orientation means that the teacher has the courage to act differently and change viewpoints, modify ways of working from the social arrangement of the classroom to the teaching materials, and everything in between. (Primary teacher, female)

Cooperation with colleagues was mentioned, this referred to sharing ideas and developing them further, as well as taking advantage of peer support and discussions in the staffroom about current issues. It also meant cooperation with partners that are outside the school community.

> It is realized in the teacher's reflection. One critically ponders on his/her ways of working, pedagogical thinking and action. An inquiry-oriented teacher discusses with his/her colleagues about, for instance, testing a new teaching method, etc. (Home economics teacher, female)

> Sharing, informal visits with each other, new ideas, time to improve old ones. (Subject teacher, female)

The teachers also mentioned an active, societal and critical orientation as a feature of research-orientation in their work. This meant both that the teacher her/himself is an active citizen and follows societal issues, but also that she/he brings those issues into the classroom as contents of teaching and seeking extra information and using them in teaching.

> Inquiry-orientation is shown in a continuous observation of the environment, comprehensively following different media, development of one's own know-how and thinking, not forgetting to encourage students to do the same, as well as pursuing inquiring and critical studying methods. (Subject teacher, female)

> One has to be interested in the changes and developments that takes place around us all the time (i.e. keep up with the times). Teachers much have the ability to deliver this to the students in a complex manner as well as thinking and planning well. (Primary teacher, male)

They also stated that relationships with students in the classroom were important. This meant, for example, that the teacher should be sensitive to the classroom climate, and take different learning styles into account. Furthermore, the teachers thought that inquiry-orientation meant that a teacher should be interested in finding out how individuals learn, should be persistent, and able to tolerate chaotic and uncertain situations in the classroom.

> An inquiry-oriented teacher wants to try something new and take on new challenges. Is interested in other things besides his/her work – the world around us. She/he brings these influences to the classes and discusses issues with the students. (Primary teacher, female)

Collecting feedback from students and evaluating and changing one's own teaching based on these evaluations is part of the inquiry-orientation according to these teachers. Inquiry-orientation for an individual teacher also means that the teacher is attentive to evaluation, and by this, they mean that the teacher needs to be curious about how the student has thought about his/her answer (in a test). It also means that the teacher should conduct systematic follow-up of their students' learning.

> A teacher should be aware of the child. The teacher should know the child's background and her/his problems and strengths. S/he should support the child and provide him/her with different instruction styles. The teacher should want to find out about different learning styles and ways. (Primary teacher, female)

> The teacher should try different ways of working in his/her work open-mindedly. She/he also learns from her/his students. (Primary teacher, female)

These teachers mentioned that inquiry-orientation also involves teachers mastering the subject contents and the curriculum and they should be able to connect different issues and master larger entities.

> Everything starts from the planning of the lesson, making timetables of what and how the student studies the matter, how the knowledge is dealt with and further developed. It is collecting materials, working on them and forming things with open eyes. (Subject teacher, female)

In conclusion, we can state that inquiry-orientation for an individual teacher's work is a very multifaceted phenomenon. There are many aspects to it, and many ways to understand it. In Table 3 we have summarized the main content classes. Here we

will present the themes, since more specific reporting of the data will be done in a research paper that will be published later.

Table 3. Inquiry-orientation in an individual Finnish teacher's work

Content class
Develop and educate (oneself)
Evaluate one's own action
Constructivist view of teaching
Using multiple methods in teaching
Cooperation with teachers or other people in the school
Active, societal and critical orientation in teaching
Inquiry as a method in teaching
Relationships with students and the class
Collects feedback
Evaluation
Subject (content) knowledge

Inquiry-orientation in the Practice of the School Community

In school community practice, inquiry-orientation took a little bit of a different shape in the teachers' opinions (see Table 4). Mostly they thought that it meant concrete solutions and organizing things in the school, such as the sharing of materials, planning and teaching together or in teams. They also mentioned flexible teaching arrangements, and having resources for field trips.

> As a community, we can act so that we develop new good ways of working that help us to achieve the goals we have set. We also can give up old ways. (Home economics teacher, female)

Inquiry-orientation also meant cooperation, at many different levels. For example, the teachers mentioned cooperation in planning, in realization as well as in brainstorming. They mentioned sharing ideas and suggestions with colleagues as well as concretely working together, for example, as a co-operative teacher.

> Inquiry-orientation is shown, in the best case, as cooperation with a colleague. (Subject teacher, female)

> Is seen in collaboration between teachers. (Subject teacher, female)

For them, inquiry-orientation also meant that the school is an active operator in constructing a systematic follow-up and actively develops itself based on these constructs. The teachers mentioned that there should be continuous development of

different operational models that the school should conduct systematic surveys concerning the work climate (for teachers), as well as surveys of students' skills in their mother tongue and mathematics. The school also needs to survey the parents' opinions, and not forget the teachers' views of the school's operating procedures.

> Inquiry-orientation in a community is seen as consideration of others, and developing best practices for the entire school community. (Home economics teacher, female)

One important factor in the school community was attitude, which mostly meant an open, positive attitude towards change, development and further education. It also referred to (personal) commitment or the principal's attitude.

> In the practices of the school community, inquiry-orientation is found, for example, in encouragement towards self-development (i.e. in-service education) from the management, as well as organising well-working ICT, and a general atmosphere favourable towards inquiry-orientation. (Subject teacher, female)

Just like in the personal accounts of inquiry-orientation the idea of using inquiries and research as a teaching method in the school community also surfaced in the classrooms, as well as organizing field trips, or laying out a garden where the students could grow plants.

Other issues that the teachers still mentioned, were justifications for actions, which means that the school community needs to be able to justify their action pedagogically, be able to change their actions if needed, as well as being willing to question old habits or routines. The teachers also mentioned that the school should find out 'what works best' together.

> For the school community, inquiry-orientation is shown in the encouragement of students, especially towards being critical and question matters. Different school projects should be initiated by students and not given in a top-down manner. The school community should be able to evaluate itself, and not become stuck doing things "the way they have always been done". (Subject teacher, female)

One issue that the teachers mentioned was *collecting feedback* and sharing it with colleagues, as well as taking it into account when planning future action.

Another aspect of inquiry-orientation was the conversational culture of the school. They mentioned that discussion was important in the working community, as well as a positive climate and culture for discussion.

> Inquiry-orientation in a school: communal development, collaboration across subject disciplines. (Home economics teacher, female)

> There are different pedagogical discussions within the teaching community. Trying out for example cooperative teaching, and reflecting. Encouraging each other to read new research literature, giving literature hints. (Home economics teacher, female)

> The school community spends time together reflecting on progress and teaching success. Planning improvements together, where these are necessary. (Subject teacher, male)

Summing up the inquiry-orientation on a school community's level, we can state that it also has a very complex profile. There are issues that touch upon individual teachers but there are also others that the entire community can influence. The role of the principal was also mentioned in creating an inquiry-oriented school community.

Table 4. Inquiry-orientation in the school community's practice

Content class
Concrete solutions and organization
Cooperation
Operational follow-ups & development
Attitude, support, supporting structures, education
Inquiry as a teaching method & expert lectures & field trips
Justifications for action and preparedness for change
Collecting feedback
Conversational school culture

Teacher Educators' Views of the Research-based Approach

We have researched the conceptions concerning the research-based approach of teacher educators (Krokfors, Kynäslahti, Stenberg, Toom, Maaranen, Jyrhämä, Byman, & Kansanen, 2011). We wanted to critically inspect how teacher educators understand the research-based idea of teacher educators and how they appreciate it. The results showed that teacher educators appreciate the research-based approach to which the university is committed, although they were sceptical about how well this vision can transfer to the students. The main findings indicated that the teacher educators understood the research-based approach as firstly, the organizing theme of teacher education (the concept), as can be seen from the following citation:

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

Secondly, they understood it as the context, which refers to the academic environment and higher education:

> "[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)

Thirdly, the teacher educators thought that if teacher education is research-based, research needs to be incorporated in it (the content).

> "How [the research-based approach] appears in the studies, it's the Master's thesis that the students do on his or her own, and the methodological studies … It's typically 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)

Fourthly the teacher educators understood the research-based approach as the goal of teacher education, in other words the teachers' pedagogical thinking:

> "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)

The teacher educators also assessed the relevance of the research-based approach to the teacher's everyday work. According to them it was clearly relevant. For example:

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

(For the full results, see Krokfors et al., 2011.)

Student Teachers' Views of Research-based Approach

We asked our student teachers' perspectives on the research-based approach. What are their attitudes towards the approach and what kinds of experiences they have concerning the realization of the research-based approach in their studies. According to our results, the students appreciate the research-based approach as the main organizing theme of teacher education. They presume that this approach is detectable in every part of their studies, as was the case in most of the courses. There are some differences between courses dealing with various aspects of pedagogical content knowledge. The students saw a research-based approach as

being less important in courses of the didactics of arts, music, craft and physical education than, in more theoretical courses. Presumably, courses which deal with skills and 'doing' were considered practical and some others theoretical. The mean of the final practicum was also rather high. In the final practicum the students should be able to combine all the theoretical knowledge that they have gained during their teacher education studies with their practical performance in the classroom. As a whole, the relatively high means indicate that the students have, in principle, accepted the idea of a research-based approach in their studies. The students expected a more research-based approach in the courses actually contained. The students appreciated the high level of the master's degree studies. In other words, they thought it valuable that teachers have rather long academic studies instead of a more practical teacher training and they felt that it was important that methodological courses started sufficiently early in the studies. It seems that the students have comprehended the basic idea of the curriculum of teacher education and this is very encouraging. (Jyrhämä, Kynäslahti, Krokfors, Byman, Maaranen, Toom, & Kansanen, 2008).

WHAT DOES THIS MEAN?

Being an inquiry-oriented teacher in the international literature often refers to a teacher who conducts inquiries as part of his/her teaching, in other words, inquiry as a teaching method. As we can see from the thoughts and views of these Finnish teachers, their conceptions are much broader. They have mentioned inquiry as a teaching method also, but mostly, being an inquiry-oriented teacher means much more to them. It is a stance, close to being a reflective teacher. According to Zeichner and Liston (1996, p. 6) a reflective teacher 1) examines, frames, and attempts to solve the dilemmas of classroom practice, 2) is aware of and questions the assumptions and values he or she brings to teaching, 3) is attentive to the institutional and cultural contexts in which he or she teaches, 4) takes part in curriculum development and is involved in school change efforts, and 5) takes responsibility for his or her own professional development. Based on the conceptions, it seems that the views of the teachers come close to Zeichner and Liston's (1996) definition.

Terms such as 'reflective inquiry, practitioner research and action research' (Lunenberg, Ponte & Van De Ven, 2007) have a close connection to certain aspects of reflection, and to some degree may be seen as synonymous to reflective practice. Based on Schön's (1987) work, Zeichner (1990) concludes that practitioners can be helped to use their own teaching as a form of research aimed at the improvement of practice, and that research-based teacher education involves efforts to encourage and support teachers' inquiries into their own practices.

It is noteworthy that no teacher specifically mentioned that part of inquiry-orientation is conducting research, whether as a teacher researcher, action researcher, or formal (*i.e.* doctoral) researcher. This is intriguing, since teacher

research has been such a 'hot potato' in various countries including Finland for some decades, now.

Furthermore, what is interesting, is that it seems to us, that the teachers brought up various issues that are very close to, for example, to what Castle (2006) discusses with regard to teacher research and autonomy: Castle (2006, p. 1096) states that teacher research gives teachers the knowledge and confidence to act as responsible professionals and that this is linked to autonomy in teaching. "Autonomy, the ability to make intellectual and moral decisions by considering various perspectives and deciding based on what is in the best interest of all, enables teachers to exercise their professionalism. Autonomous teachers know why they do what they do and can communicate that understanding to others." (Castle, 2006, p. 1096.)

Based on our results, it seems that teachers' inquiry-orientation is first and foremost an attitude towards one's work. The focus is on the development of one's self, as well as the development of the school community, alternative ways of working, reflection, dialogic, feedback etc. These teachers are a group of very aware people, because some members of the group are teaching practice mentors, and other members will become mentors. Thus, they are interested in the school-university partnership. It also seems, that the main organizing theme, and ideology of the teacher education has been very well adopted in the field.

Furthermore, we encourage student teachers to conduct 'real' research on the practice of teaching in a so-called "research practicum", in which the main point is that a student combines collecting data for his/her research during the teaching practice period. Quite often this in reality is some sort of teaching intervention. (see Jyrhämä, 2011; Jyrhämä & Maaranen, 2008). Teaching practice environment – both teacher training schools as well as field schools – support this inquiry-orientation due to their task as providers of the teaching practice experience. Many of the mentor teachers also become interested in further education in the form of doctoral studies. (see *e.g.* Syrjäläinen & Jyrhämä, 2008.)

We aim to enhance the collaboration between schools and the universities, because it seems to be an effective, refreshing element for both parties, and it is extremely important for the future dialogue between academics and practitioners.

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PART III TEACHING AND LEARNING FOR LIFE:

ACADEMIC SUBJECTS

HEIDI KRZYWACKI, LEILA PEHKONEN & ANU LAINE

8. PROMOTING MATHEMATICAL THINKING

in Finnish Mathematics Education

ABSTRACT

In this article, we outline some of the main characteristics of the mathematics education in the Finnish educational context. In Finland, teachers are educated to be autonomous and reflective academic experts at both primary and secondary school levels. This policy means there is a strong emphasis on teachers' independence and autonomous responsibility and it also has many consequences for teaching mathematics. We start by discussing the main features of Finnish mathematics education through the outline stated in the National Core Curriculum and reflecting on the features of teacher education, which prepares academic, pedagogically thinking teachers for school work. In Finland, mathematics education is highly dependent on teachers and their understanding of teaching and learning mathematics. Secondly, we elaborate the practical and environmental aspects influencing schooling and the way mathematics is taught in Finnish comprehensive schools. The central aspects characterising Finnish mathematics education, such as the distribution of lesson hours, the availability of pedagogically well-structured learning materials and the principles of school assessment, are discussed. To conclude, Finnish teachers responsible for teaching mathematics play a significant role in maintaining and developing the quality of school mathematics education.
Keywords: mathematics education, comprehensive school, curriculum, teacher education

INTRODUCTION

In Finland, basic education in mathematics is carried out by primary school teachers responsible for the first six years of schooling, i.e. grades 1-6 when pupils are 7 to 12 years old, and by specialised subject teachers, who teach

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 115–130.
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mathematics at secondary school level, i.e. grades 7-9 when pupils are 13 to 16 years old. In practice, Finnish primary school teachers teach more than two thirds of mathematics lessons in comprehensive school. The achievements of Finnish pupils are, at least to some extent, based on the high-level academic teacher education implemented in Finland (see more in Chapter 2). Obviously, the number initial teacher education courses, which are intended to give student teachers expertise in teaching and learning mathematics as well as those for special interests in mathematics education, differ for teachers at different school levels. Especially, primary teacher education programmes have always been popular; only about 10 per cent of the gifted and talented applicants are accepted. Even though becoming a mathematics teacher at the secondary school level is less popular, there is no lack of qualified subject teachers in mathematics in Finland. Teachers in Finnish comprehensive schools are not only well-educated academic experts with university Master's degree, but they are also motivated, autonomous professionals, who are relatively committed to their work (Simola & Hakala, 2001; Simola, 2002).

The outcomes of Finnish mathematics education have proved to be outstanding according to PISA testing (OECD 2004; see more in Chapter 1). The success is actually not surprising considering the development of mathematics education during the past twenty years. From the late 1980s, serious efforts were made to develop mathematics teaching and learning in schools. At that time, an informal voluntarily established committee, 'Mathematics teaching in the 1990s, was formed by experts in mathematics teaching at different levels, publishers, researchers and administrators. Teachers had an essential role in the committee, which discussed the future and the need for reforms in mathematics education. After two years of continuous informal meetings, a booklet about the main outcomes and recommendations for the further development of Finnish mathematics education, for example, some practical ideas and examples of exercises, was published (Halinen et al., 1991). The committee was successful in sketching upcoming and current developmental trends in mathematics education. The booklet became an important trailblazer for future reforms – among others the curriculum reform in 1994.

There has been a clear trend to improve Finnish mathematics and science education in general. In 1995, the National Board of Education launched a national development project, the LUMA – project (LU refers to science and MA to mathematics) that lasted from 1996 until 2000 (Heinonen, 1996). The aim was to strengthen knowledge and skills in mathematics and science education at all levels of schooling, while providing special attention to the significance of learning the respective subjects. There have not been dramatic changes in Finnish education in the 21st century; although the spirit of developmental work and special attention to mathematics and science education is still there. The national LUMA Resource Centre coordinated by the University of

Helsinki has continued the developmental work as an organisation that oversees cooperation between schools, universities and industry. The aim of the activities is to promote and improve education in natural science, mathematics, computer science and technology at all levels. However, some critical voices can be heard when discussing the quality and competence of the students entering mathematical programmes in higher education institutions. According to the responsible providers of education, the computational skills and mathematical routines of students starting at their institutions do not meet all their expectations, and therefore the challenge still remains of how to achieve the learning aims set by the respective study programmes.

In this article, we outline the characteristics of Finnish mathematics education by discussing teaching and learning school mathematics, the core idea of mathematics education described in the national curriculum and the school environment influencing the implementation of school mathematics. We elaborate on Finnish mathematics education especially from the perspective of the teachers, who can be seen as autonomous professionals, meaning that they are responsible for the planning, implementation, and assessment of teaching and learning mathematics. As a result of the autonomous role of the teachers, the nature of teaching mathematics in Finnish classrooms is highly dependent on individual teachers.

THE STARTING POINT OF FINNISH MATHEMATICS EDUCATION

There are two essential aspects, which have an impact on the way mathematics education is carried out in Finland: the outline of mathematics education described in the National School Curriculum, by which teachers are bound when teaching mathematics in their classrooms, and teacher education organised by the universities. Teachers, both at the primary and secondary school levels, have an essential role in implementing the core ideas of mathematics education.

The Core Idea of Mathematics Education According to the National Core Curriculum

The previous national core curriculum, the Framework Curriculum for the Comprehensive school (FCCS 1994) published in 1994 by the National Board of Education was an important basis for successful mathematics education in Finland. Before that, in the 1980s, the National Core Curriculum was a more detailed document setting the aims for and describing the contents of various school subjects. The main change took place when the curriculum was written giving special emphasis to the spirit of constructivism. The 1994 FCCS was much more flexible, less centralised and detailed than its predecessors (see more

in Chapter 6). All Finnish teachers truly became involved in curriculum planning and writing, although not all the teachers were responsible particularly for mathematics.

Problem solving – both as a method and as content - was set as an underlying principle along with mathematical-logical requirements. In addition, teaching geometry, statistics and number concept as well as proper basic counting skills were widely discussed. Stress was laid on pupils' thinking and understanding mathematics, and co-operative learning methods were emphasized. In addition, it is clarified in the curriculum that: 'pupils of all ages and all levels should be allowed to build and make models with their hands in order to form correct mental pictures and concepts' (*ibid*. 83). Various, easy-produced, non-expensive and self-made manipulatives and a range of exercises were introduced in the support material. In practice, the ethos and practical examples provided in the documents are consistent with the tasks used in PISA testing.

The latest educational and psychological research on learning mathematics was taken seriously into consideration in the 1994 FCCS and consequently, the main changes in mathematics education took place almost 20 years ago. However, since the main ideas of Finnish school education were described in a broad way, these changes were not put into practice as such, even if additional materials (Opetushallitus 1995) were provided to support understanding and implementing the new ideas of mathematics education. The current core curriculum (NCCB 2004) differs from the previous one in some ways, even if neither the spirit of Finnish comprehensive school in general, nor the underlying ideas of constructivist mathematics education have changed. The current curriculum takes more control over the contents of teaching and learning, and consequently, the overall outline of education is described in more detail. Mathematics education is considered as the basis for developing mathematical and logical thinking, which are seen to be potentially important for societal activities in the future. Since learning mathematics is seen to be abstract and challenging for children to understand, the need to use didactical models and concrete materials such as manipulatives should be addressed in good mathematics teaching. In addition to transforming mathematics into something more visible and concrete, applying mathematical thinking in practice and emphasising the importance of reasoning are also at the focus of the learning goals. Students should learn how to reason their thinking and communicate mathematical processes with other learners. The essential aim of learning mathematics is to acquire a thorough understanding of mathematical concepts and based on that, learn how to apply the acquired knowledge in different situations. To conclude, the current national curriculum still outlines only the main principles of teaching mathematics in Finnish schools without going into detail. The details are elaborated in the local level curricula.

Teacher Education and the Main Principles of Good Mathematics Education

Finnish teachers have a comparatively autonomous role in teaching mathematics in their classrooms, and therefore, teachers' beliefs, skills and knowledge-base of mathematics education and their potential to put the ideas into practice matter (Krzywacki, 2009). Teachers face challenges at many levels when they teach mathematics. However, Finnish teachers are committed to addressing these demands and they do so in their own individual ways. This, in turn, puts weight on the quality of teacher education, and how well the initial education of teachers manages to provide a starting-point for expertise in teaching mathematics. Since each Finnish university is allowed to design its teacher education programmes a bit differently, there are minor differences between the implementation, amount and contents of mathematics education courses (Laine & Kaasila, 2007; see more about teacher education in Chapter 2). Here, we will use teacher education at the University of Helsinki as an example.

In the initial primary school teacher education, mathematics education is a special focus among the multidisciplinary course providing readiness for teaching all school subjects at primary school level. In practice, the extent of mathematics education course at the University of Helsinki is 7 ECTS out of the total 300 ECTS comprising the overall programme. In addition to the basic course compulsory for all student teachers, they all teach mathematics during their teaching practice periods that provide actively mentored and supervised teaching experience (20 ECTS). Only some of the teacher students specialize in teaching mathematics through extended studies. Some 10 to 15 percentage of the primary school teacher students complete 25 ECTS of advanced mathematics education courses, comprising of mathematical courses and the courses dealing with teaching and learning mathematics, such as special needs in mathematics education. It is also possible to complete a minor (60 ECTS) specialising in teaching mathematics at lower secondary school. Only 5 per cent of the students complete these studies comprising mostly of the mathematical courses provided at the Department of Mathematics and Statistics.

In secondary school teacher education, at the University of Helsinki as well as other Finnish universities, a major in university mathematics is the main component of the degree that takes approximately five or six years to complete (see more about teacher education in Chapter 2). The programme is grounded on building up strong mathematical content knowledge, i.e. the programme consists of university mathematics as a major (150 ECTS), another school subject such as chemistry or physics (60 ECTS), and one year of pedagogical studies (60 ECTS) that includes supervised teaching practice modules (20 ECTS). Pedagogical issues are discussed in general educational courses (20 ECTS), as well as special features of teaching and learning mathematics in the special courses of mathematics education (20 ECTS). The production of a small-scale pedagogical thesis in mathematics education is also part of the programme.

Here, we introduce four themes characterising the spirit of mathematics education that are mediated in pre-service teacher education at Finnish universities. Even if the structure of the teacher education programmes are varied, a common foundation is laid for quality mathematics teaching and learning. First, affective aspects are considered important to studying and learning mathematics. Traditionally, both in Finland and internationally, the outline of mathematics education has been established through describing cognitive aspects and the aims of learning outcomes regarding mathematical skills and knowledge. However, recently, Finnish educators have started to underline the importance of views and attitudes towards mathematics (Hannula, 2004; Pietilä, 2002). The need for improving positive attitudes and interest towards mathematics is also mentioned in the current national curriculum (NCCB 2004). Thus, traditional view of the aims for mathematics education is broadened by setting the aims also concerning affective aspects in learning mathematics.

Second, the use of concrete materials and didactical models for improving the understanding of mathematical concepts is also seen as an underlying theme of Finnish mathematics education. This is discussed during the teacher education courses, for example, in group activities and when piloting the use of concrete materials in teaching practice. In the teacher education programme at University of Helsinki, the main idea behind number systems is elaborated with the help of concrete materials. This is to help students to understand the main mathematical concepts and consider how to take this special viewpoint into consideration in their teaching, especially through identifying the difficulties that learners might face when learning the ten-base system.

Third, problem solving and the significance of reasoning and thinking processes are also addressed in the pre-service teacher education. Traditionally, the process of teaching and learning mathematics, whether in Finnish schools or internationally, has not underlined the importance of oral communication and co-operative methods in mathematical processes. However, since interaction with peers enhances the need for communicating about the processes and the reasons underpinning them, co-operative learning and working in pairs or in small groups are regarded as workable methods for promoting skills in problem solving (Good, Mulryan & McCaslin, 1992). The emphasis is on learning to process complex mathematical situations in a flexible and creative manner. When working together with others, learners are in a situation, where speaking about mathematical problems and the phases of the solution process is necessary. It is natural to speak about processes and give reasons for making decisions on how to carry out procedures when sharing one's understanding with others.

The fourth theme is related to understanding and supporting students, who have learning difficulties with, and special needs for, mathematics learning. Teachers in comprehensive schools, especially those teaching the first grades of

primary school, should have a basic knowledge about learning difficulties and dyscalculia, and based on that, be able to recognise learners who might need some extra support in learning mathematics. Often the question is not about serious learning problems but recognising some common misconceptions and mini-theories, i.e., rules and misconceptions developed by the pupils themselves that are common in mathematics (Claxton, 1993). In addition to recognising pupils with challenges in learning mathematics and providing extra support in problematic situations, it is essential to possibly prevent difficulties in learning through taking the most common mini-theories related to different mathematical content into consideration. For example, the conceptual changes associated with understanding the characteristics of rational numbers are promoted by using manipulatives in teaching and learning fractions and providing parallel tasks (Merenluoto & Lehtinen, 2004).

IMPLEMENTATION OF MATHEMATICS EDUCATION IN FINNISH COMPREHENSIVE SCHOOLS

In the following, we outline some environmental and practical features that influence the way mathematics is taught and studied in Finnish comprehensive schools.

Distribution of Lesson Hours in Mathematics

In the OECD countries, the total number of hours devoted to mathematics teaching in Finnish schools is only larger than those of the Netherlands (Välijärvi *et al*., 2002, p. 262), i.e. 32 hours of lessons hours a week are allocated for teaching and learning mathematics during the nine years of comprehensive school. Time is not wasted on mathematics education in Finnish comprehensive schools, although the number of mathematic lesson hours is higher than that given to most other school subjects. In fact, only lesson hours indicated to mother tongue are greater than those to mathematics. The Council of State gave its latest decision on the distribution of lesson hours in 2001 (Distribution of Lesson Hours for Basic Education 2001), which increased the minimum amount of mathematics by one lesson compared to the previous decision.

According to the decision, mathematics must be taught for at least 18 lesson hours a week (i.e. 18 times 45 minutes) during the first five years at the primary level of comprehensive school, and at least for 14 hours a week during the four years at the upper level of comprehensive school. This means approximately 3 to 4 hours a week at the primary school level as well as at the lower secondary level. In a similar way, minimum hours per week were given for all school subjects as well as the maximum hours pupils were allowed to work at school. However, no hourly maximum limits were set for any school subject. In addition, the local curriculum level must be set so that pupils are eligible to continue their

studies at the next school level even if they had studied the minimum amount of mathematics set by the decision of the Council of State. Within these constraints, the schools are responsible to make their own decisions about the distribution of lesson hours.

Learning Materials as a Resource for Teaching and Learning

Learning materials, especially pupils' textbooks have an important role in Finnish mathematics education. Finnish primary school teachers are especially very loyal to their mathematics textbooks – as are teachers all over the world. In Finland, primary school teachers have always been very satisfied with the mathematics textbooks and teacher's support materials. According to a study by Niemi (2004), 53% of teachers in the sixth grade found that textbooks are a better base for the planning mathematics teaching than the school's own curriculum. This is in conflict with the underlying principle of local level curriculum work. Secondary school teachers have a slightly different attitude towards ready-made learning materials. They rely on their expertise in mathematical content knowledge and specialisation in teaching and learning mathematics, and therefore, the need for support material and ready-made pedagogical ideas is different at the primary and secondary school levels. This can be seen also in the supply of support materials.

In Finland, learning materials are produced by ordinary teachers, who are interested in mathematics education and currently working at schools. Therefore, they are very familiar with the conditions in schools. Currently, there are several parallel textbooks from different publishers, i.e. 5 or 6 textbooks at the primary level and 4 to 6 at the secondary school level. Even if the textbooks differ slightly from each other, all the learning materials and textbooks are generally speaking rather similar. All textbooks provide various materials for problem solving and statistics, ideas for group work and projects. They also provide a good supply of basic exercises as well as more complicated tasks for all pupils. There are also collections of challenging tasks for those pupils who are more advanced or/and interested in mathematics. It is the teachers' responsibility to choose the textbooks and other materials for their pupils as well as the teaching methods. It is noteworthy that the quality of the learning materials is not directly equivalent to the quality of teaching, as the teacher can use all kinds of materials either appropriately or otherwise. They can also choose to teach without textbooks if they want to, although this alternative is seldom used.

Teachers' conceptions of teaching and learning materials in mathematics reveal something about Finnish mathematics education. In a case study (Pehkonen, 2004a), nine primary teachers were interviewed about what constitutes good and stable elements in school mathematics teaching and learning. The mathematics

textbooks were seen as important tools for teachers in maintaining their teaching at an appropriate level and providing ideas for new ways to teach. This justification was revealed by the teachers speaking appreciatively about the textbooks and their use in mathematics education and of positive accounts of using textbooks. Teachers claim that the textbooks guarantee a stable quality of teaching, since they are considered to be logical and explicit. They contain the essential facts and the tasks are connected to everyday life. In addition, the use of textbooks was seen as a means for teachers to keep their teaching logical and coherent. Mathematics textbooks help teachers with their workloads, because the books provide ready and sensible structures for lessons and enough exercises for the pupils.

Actually, mathematics textbooks were considered to be written for pupils and their learning processes. Moreover, textbooks were seen to be a source of motivation; they are colourful and the exercises are varied. The pupils' keen interest was seen as evidence of their high quality. Teachers of the youngest children claimed that children love their mathematics books. Since a lot of nowadays schoolwork is organised in small groups, teachers find that pupils love those peaceful moments when they are allowed to work alone and proceed at their own pace. The shared belief is that, with the help of textbooks, children can study the facts they are expected to learn.

Nowadays, other kinds of learning materials and computer-aided facilities are increasingly used in Finnish schools. Teachers can choose what they use and how to use these modern facilities in a way that suits their personal teaching styles. Even if Finnish schools are rather well equipped (Eurydice, 2004; Eurydice, 2011), the challenge lies in using these resources in meaningful ways from the perspective of learning mathematics. The technological materials are often related in a complementary way to existing learning materials, such as book series. In accordance with the underlying idea of using concrete materials and didactical models in teaching and learning mathematics, textbooks also include some print versions of manipulatives, for example, materials for illustrating the ten-base system and basic calculations during the first grades in primary school. There are also additional materials attached in teacher guidebooks, for example, geometrical obstacles to be used by teachers in teaching and learning geometry.

In Finland, teacher guidebooks are structured to support teachers in their everyday teaching work. The guidebooks provide help in designing mathematics lessons and give ideas for implementing the main underlying ideas of mathematics education in Finland. In practice, the pedagogical ideas provided in the teacher guidebooks are presented in parallel with a learner's page view and structured in accordance with traditional parts included in mathematics lessons (see Figure 1. Best practice example).

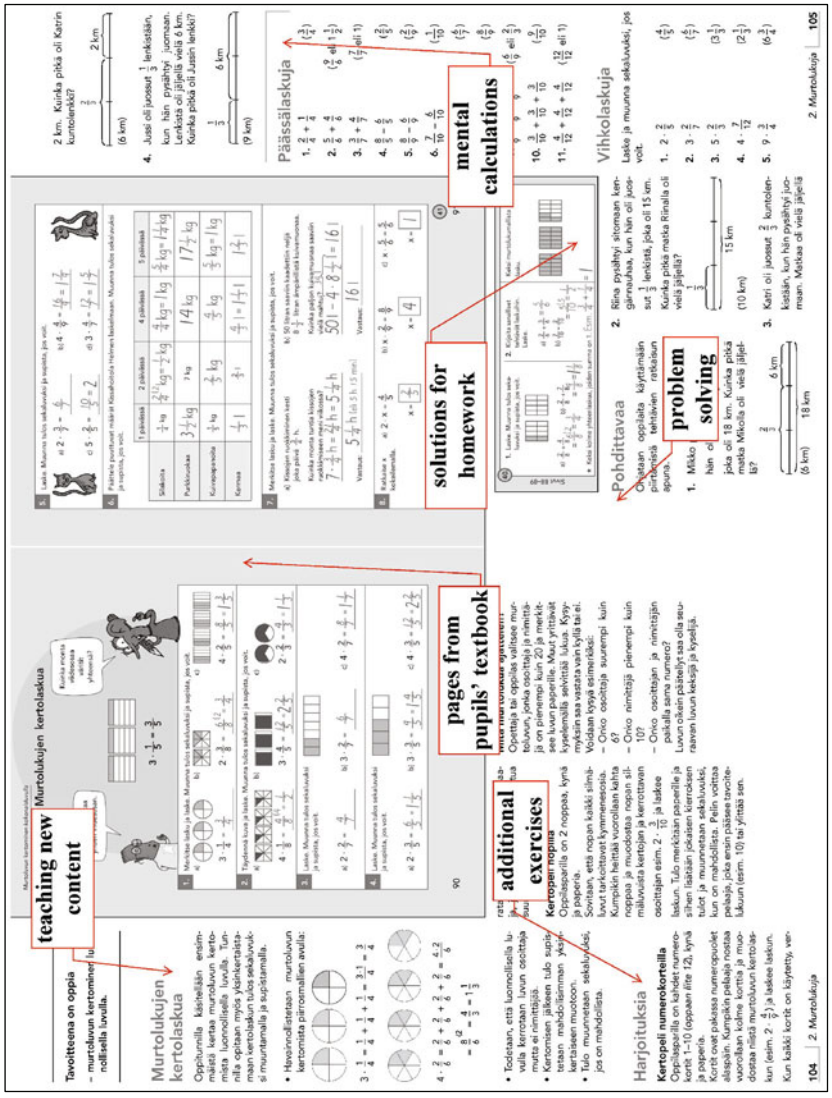

Figure 1. Best practice example: a mathematics lesson in a teacher's guidebook (Lilli et al. 2010).

Teaching Mathematics in Finnish Classrooms

We cannot claim that Finnish mathematics education uses very innovative teaching approaches. The fact is that teaching in general as well as especially in mathematics education is rather traditional in Finnish classrooms (Norris *et al*., 1996). In mathematics, teaching is mainly teacher-centred frontal teaching of the whole group, but nevertheless, pupils have an active role and they are highly involved. Although, there is a good deal of conservatism in the teaching methods, focusing on this alone does not give the whole truth. Finnish teachers avoid being too hasty and want to guarantee learning opportunities for their pupils. They try to avoid 'educational entertainment' (Pehkonen, 2007). However, teachers do adopt new ideas and methods that they find meaningful and useful. For example, some teachers have a special mathematics lesson with problem solving or project work once a week. According to Niemi (2004), more than 60% of primary school teachers state that they use a lot or quite a lot of various co-operative teaching methods in their mathematics lessons.

It seems that Finnish teachers have found a successful way to combine traditional teaching methods with some innovative approaches. Some traditions and routines have proved to be very fruitful and the structure of an average mathematics lesson is rather unchangeable. It has been a tradition for decades that a short time, about a 5-minute session at the beginning of a mathematics lesson is devoted to mental calculation or some other orientation activity. All teachers' support materials provide a collection of mental exercises for every lesson to help the teachers. Even if the time used for this kind of practising is short, it is repeated from lesson to lesson from one year to the next.

Usually, what follows is checking the homework that is given after each mathematics lesson in order to repeat the main points of the previous lesson. However, even if Finnish pupils use less time on their regular mathematics homework than their peers in most OECD countries (Välijärvi *et al*., 2002, p. 262), homework has a special role in Finnish mathematics classrooms. Most teachers make a quick round of the classroom and make sure that all the pupils have completed their homework. Usually, difficult or complicated tasks are explained by selected pupils to the rest the class. Consequently, the pupils are regularly given plenty of feedback about their homework. Negative feedback is not given if pupils are unable to complete their homework but their parents are informed if they do not do their homework.

The lesson continues with the teacher introducing and teaching new topics, which is followed by individual work through tasks that help the learners study and acquire the knowledge set in the lesson aims. The guidebook highlights some essential pedagogical ideas that a teacher should take into consideration when discussing a topic. A large proportion of mathematics lessons are devoted to silent, individual work. The pupils can practise at their own pace and teachers help those who need support. Individual work is very consistent with the ideas of

constructivism, although it is not a new and modern way of working. Homework is usually given to the pupils at the end of the lesson to promote the learning process.

Assessment Policy

As Finnish teachers have a considerable amount of decision-making authority in schools they can, among other things, determine quite a lot of their course contents and pupil assessment policies. Finnish pupils are not assessed by national tests or examinations, which emphasise the importance of teacher-conducted assessment practice. On the national level, the outcomes of the Finnish comprehensive school are followed only by sample-based surveys at the end of the sixth and ninth grade of comprehensive school. The results are published only at the system level, while the results of individual schools are delivered exclusively to the schools concerned.

In the 1990s, the principles of pupil evaluation were reformed in conjunction with the curriculum reform. The main principle was no longer to find differences between pupils - as it had been earlier - but to improve pupils' learning. The main goal was to determine how to help pupils better understand mathematics. Various methods in pupil assessment were introduced, for example, how to evaluate pupils' mathematical processes and how to evaluate products. At that time, pupil self-assessment was a totally new idea in Finnish education, but very soon it was adopted at all school levels.

All Finnish teachers are taught to design and implement assessment in mathematics during their pre-service teacher education. Primary school teachers are capable of designing their own tests and assessment tools. All primary school mathematics textbooks provide collections of ready-made tests, and teachers can use them as an additional resource if they want. Naturally, the use of these tests is one method to reach some uniformity in assessment. Anyway, as all teachers are involved in the process of planning the school curriculum the fact is that Finnish primary teachers are very well aware of the curricular goals for mathematics. In addition, they know what contents and to which level children are expected to learn mathematics.

Talent Development for All Students

A law (Basic Education Act 1998/628) regulates the compulsory education of all Finnish children. The central point of the Basic Education Act is that pupils' age and talents must be taken into consideration in organizing school education. The law guarantees the right of pupils to be educated in a manner that is best suited to them. The same principle can be seen in the Development Plan in Education and Research published by the Ministry of Education for the years 2007-2012. This document states that

> 'The premise in developing general education is to secure basic educational rights for all pupils and students according to their abilities and special needs' (*ibid*. p. 22).

One of the leading principles in the Finnish education policy has been to provide all pupils with equal and high-quality educational opportunities and to remove obstacles to learning especially among the least successful pupils (Ministry of Education, 2007). Help is given most during the first school years. This has been the Finnish educational mission for decades. It can be seen as an ideological standpoint, but it has its pragmatic perspective as well. Educational equality has been seen as an investment in human capital. Small nations, like Finland, cannot afford to waste any reserve of talent. In the light of PISA findings, we seem to have managed very well in these aims (*e.g*., OECD 2004, pp. 144–145).

According to the Basic Education Act, schools must cooperate with parents. These principles create the opportunities for education of all pupils' with different capacities – those with learning difficulties as well as those who are gifted and talented. The sooner special needs as a learner are recognised, the better schoolteachers can provide support in learning process and possibly avoid difficulties in the future.

Gifted pupils are not mentioned as a special group in any law or official document regulating Finnish school education. Gifted education pedagogy as such is not typical to the Finnish school system, meaning that it is not taken into consideration significantly in everyday schooling. However, it can be said that opportunities are provided for developing the talents of all pupils in accordance with their needs (Pehkonen, 2004b). Although, it must be said that there still are, particularly at primary level, academically gifted pupils who are not given special attention. The sizes of teaching groups vary, and there are different kinds of learners integrated in heterogeneous classes. Therefore, much is dependent on a teacher's interests and skills. Especially at the primary school level, it might be difficult for primary school teachers who have not specialized in mathematics to provide academic challenges for any of their pupils who are exceptionally gifted in mathematics.

To conclude, the Finnish view on education and giftedness is to concentrate more on talent development than on gifted education. This does not mean leaving the most able and capable pupils without special nurturing, but the main concern is to develop the talents of all the pupils and take also care of those with learning difficulties. The full use of all talent reserves is a challenge to Finnish education and an investment for the future. Educational equality is promoted by providing special needs education in mathematics as part of mainstream schooling. The idea is to support students with different talent profiles individually in mixed classes, not by grouping the pupils based on their mathematical talents but dealing with their individual needs through special lessons and exercises designed in cooperation with special needs education teachers.

CONCLUDING REMARKS

Finnish pupils seem to like mathematics especially at the primary school level based on studies that have found pupils' attitudes towards mathematics to be quite positive. According to Kupari (1999), mathematics is one of the five most popular subjects among 4th and 6th graders. The attitudes are most positive during the first school years. However, attitudes seem to turn less positive over time. Niemi (2004) has found that sixth-graders had still mildly positive attitudes (scale from 1 to 5; M = 3.3) and one-third of sixth graders claimed that mathematics was their favourite school subject. It is noteworthy that expressing strong emotions or feelings is not typical in Finnish culture, and consequently, learning mathematics is not considered in an emotional manner either. Finnish pupils have mostly very sensible and neutral attitudes towards schooling and mathematics is seen as an important and useful school subject rather than something to be emotional about (Niemi, 2004, pp. 151–152).

We have presented the outlines of teaching and learning mathematics in Finnish comprehensive schools in order to describe the facilities influential to functional mathematics education in Finland. One of the features characterising mathematics education in the Finnish education system is the independent role of the teacher. Although primary school teachers are not usually experts in mathematics, they are professionals in teaching and education. All teachers have a solid knowledge base in education and appropriate skills for self-development in work. At the secondary school level, specialised subject teachers are responsible for teaching mathematics. They are experts in their respective subject, and most of them are deeply interested in developing their methods of teaching mathematics and promoting learners' interest in mathematics learning. Teachers know how to develop skills, nurture talent and take care of the overall well-being of a child. Even if mathematics teaching seems to be quite traditional in Finnish classrooms (Norris *et al*., 1996), the teaching and learning process is guided by professionals who are aware of the learning objectives within the core curricula. It is one of the teachers' responsibilities to choose appropriate activities and materials to implement these objectives. Using teacher-conducted assessments instead of national tests and examinations especially gives teachers enough scope to independently plan and teach mathematics. Teaching and learning mathematics at the primary school level seem to provide a good and sound basis for studies at the upper secondary level. Finnish teachers have shown that there are many ways to teach mathematics well.

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JARI LAVONEN & KALLE JUUTI

9. SCIENCE AT FINNISH COMPULSORY SCHOOL

ABSTRACT

In order to ensure the reader understands the reasons for Finnish students' high achievements in the PISA Scientific Literacy Assessment, this chapter describes the implementation of the national level science education policy through national and local level curriculum and teacher education. We highlight: (1) the science curriculum for compulsory schools and the Finnish approach to implement it through local level curriculum (2) the science teacher education programme, and (3) science teaching and learning at the school level and assessment. We argue that aims and content areas described in the National Core Curriculum for Basic Education 2004 are very compatible with the competencies described in the PISA 2006 framework. Further, we would like to emphasise that Finnish science teachers are academic professionals, masters in their subject with intermediate level studies in education.
Key words**:** PISA Scientific Literacy Assessment, science education policy, science curriculum, science teaching and learning, science teacher.

INTRODUCTION

Finnish students have obtained the highest score in the PISA 2003, 2006 and 2009 Scientific Literacy Assessment among the students in OECD countries. In the year 2000 Scientific Literacy Assessment, the Finnish students were third in the ranking. The average science score of the students have varied between 538 and 563 in the PISA scale (in the PISA scale the mean of all students in OECD countries is 500 and the standard deviation is 100). In 2006 science was the main topic in the PISA assessment. Therefore, there is specific information available in the PISA 2006 assessment data on students' performance in science, attitudes and opinions about science education. For example, the percentage of students in the lower proficiency level (low achieving students) was in Finland 4.1% while it was 19.3% on average in OECD countries. At the two highest proficiency levels the percentage of Finnish students was 20.9% while it was 9% on average in OECD countries. Finland had the lowest standard deviation (SD = 81.4 score points) between students in well performing OECD countries. The science mean score was

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 131–147.
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562 for males and 565 for females in Finland. Although the girls' score is higher, the difference is not statistically significant. (Lavonen, 2008).

After PISA 2006, Finnish science education scholars have put forward several explanations for Finnish students' success. Pehkonen, Ahtee and Lavonen (2007) state that there exists no clear single explanation, but a combination of several factors might explain Finnish students' PISA results. The following reasons seem to be the most agreed in Finland:

– A national level core curriculum and implementation process at the municipality level
– Science teaching is subject-oriented in the primary and lower secondary levels. Further, teaching aims to transmit the nature of science
– Teachers as autonomous and reflective academic experts

(Kupari, Reinikainen, & Törnroos, 2007; Pehkonen, Ahtee & Lavonen, 2007; Kim, Lavonen & Ogawa, 2009).

The Finnish educational system is characterised by the devolution of decision power considering curriculum and assessment policy at the local level for ordinary teachers. Within the framework of the National Core Curriculum (FNBE, 2004) each municipality – or even one school – plans a local curriculum and collects assessment data for evaluating education. The design of the local curriculum is meaningful primarily because of the emphasis on the design process rather than the end product of the curriculum document. The local curriculum design process engages teachers in the development of schooling.

Based on previous introduction and speculations of student success in science it is appropriate to focus here on the science curriculum, science teachers and science teaching in the Finnish science classroom to get an overview of science education in Finland and to better understand the reasons for the students' success in the PISA assessment. In detail, we believe that the following three viewpoints will help the reader understand science education in Finland as well as Finnish students' PISA results.

1. A comparison of the Finnish science core curriculum for compulsory school and PISA 2006 Scientific Literacy Assessment framework (OECD 2007a; 2007b)

2. Analysis of school science teaching, learning and assessment applying the PISA 2006 School Questionnaire (OECD, 2005a) and the Student Questionnaire (OECD, 2005b) data.

3. Description of the science teachers and teacher education programme.

In this chapter, we use the following terms connected with the curriculum. Goals are the overall purpose of a school subject or a course within a national level curriculum. Aims and objectives break down goals into measurable behaviours. A syllabus is a description of the topics or main content of a subject or a course. Standards are statements of what students are expected to know and be able to do or have attained by the end of a course or compulsory school.

SCIENCE IN THE NATIONAL LEVEL CURRICULUM

Internationally, like in the UK, USA and in Scandinavian countries, it is common that science is taught in grades 7 to 9 as an integrated subject by science teachers who have qualifications in all science subjects or in some cases only in one subject. In Finland, science is divided in lower secondary school and partly in primary school into the separate subjects of physics, chemistry, geography, and biology as well as, recently, health education. This is not a very common solution. In Finland, geography is included as a science subject, because the subject has its roots in physical geography. In this volume, cultural geography is introduced together with history and social science. Allocation of science-related subjects to grades in the Finnish curriculum is illustrated in Table 1.

Table 1. Allocation of science subjects to grades (lesson hours or 45 min/week/year) in comprehensive school.

Grade	1	2	3	4	5	6	7	8	9
Students' age	7	8	9	10	11	12	13	14	15
Level (unofficial)	primary school						lower secondary school		
	Compulsory school, Basic education								
Science subjects	*Integrated* environmental and natural studies is a subject group comprising biology, geography, physics, chemistry, and health education. *2.25 lesson hours/week/year*				*Integrated* Biology and geography *1.5 hours* Physics and chemistry *1 hour*		*Separate*: Biology *1.2 hours* Geography *1.2 hours* Physics *1.2 hours* Chemistry *1.2 hours* Health education *1 hour*		

An experimental orientation is emphasised in the National Core Curriculum (FNBE, 2004). It means both the physical (hands-on) and mental activity (mind-on) of the student emphasising empirical meanings of the concepts (see, for example, Lavonen *et al*., 2004). The role of a teacher is important in this process. The teaching/learning process is emphasised:

> "The starting points for physics and chemistry instruction are the students' prior knowledge, skills, and experiences, and their observations and

> investigations of objects, substances, and phenomena. From these, the instruction progresses towards the laws and fundamental principles of physics and chemistry."
>
> "In biology instruction the pupil is guided in focusing attention on the interactive relationships between people and the rest of nature, and human responsibility for protecting natural diversity receives emphasis. The instruction will develop the pupils' knowledge of nature and guide them in understanding basic natural phenomena." (FNBE, 2004)

The main goals of science education are:

> "The purpose is to help the students both (i) to perceive the nature of science and (ii) to learn new scientific concepts, principles, and models; (iii) to develop skills in experimental work and (iv) cooperation; and (v) to stimulate the students to study physics and chemistry (interest)." (FNBE, 2004)

Descriptions of "learning outcomes" in a national level curriculum are increasingly used in national level curriculum documents to enhance the transparency and accountability of learning outcomes, and to increase the quality of learning (Spady, 2003). However, pre-defined learning outcomes and national level assessment are not the only ways to assure quality of teaching and learning at the national level, and it is noteworthy that the quality assurance of education can be approached from different perspectives (Hargreaves, Earl, Shawn & Manning, 2001; Sahlberg, 2004). In Finland, learning outcomes have not been used to express the aims or knowledge and skills students should learn. In the Finnish National Core Curriculum (FNBE, 2004), the general goals and subject specific aims as well as core contents of each school subject (syllabus) are described on a general level.

In the Finnish National Core Curriculum specific aims and contents are not allocated to a certain grade but between grades, for example, for grades 7-9 (FNBE, 2004). In the Finnish curriculum the aims for science education are the most important part in the framework curriculum. They are compared to legislation and teachers should follow the aims while they are planning science lessons, teaching and assessing. The list of contents, the syllabus, and descriptions of good performance are described in the framework curriculum to help teachers in their work. Altogether, the extent of science in the national level document is about 30 pages.

In the Appendix a comparison of Finnish National Core Curriculum aims with PISA 2006 is presented. In the presentation the aims for science education are classified into the categories typically found in the science education literature (*e.g.* Hodson, 1996; Millar, Le Maréchal & Tiberghien, 1999, pp. 42–47): 1) science subject matter, 2) scientific methods, 3) nature of science, 4) the pupils' interest to

study science subjects, 5) the pupils becoming familiar with society and decision making, and 6) cooperative skills.

According to the PISA 2006 framework (OECD, 2006), the PISA assessment emphasises science competencies, defined in terms of an individual's scientific knowledge and use of that knowledge to identify scientific issues, explain scientific phenomena and, draw evidence-based conclusions. In addition, the framework emphasises understanding of the characteristic features of science as a form of human knowledge and enquiry and the awareness of how science and technology shape our material, intellectual and cultural environments. The Finnish national level curriculum highlights the aims considering the learning of scientific method as described in the Appendix. However, instead of using the PISA wording "identify scientific issues", the following expressions are used in the National Core Curriculum: to recognise, to observe, to formulate a question, acquiring of knowledge, and looking for information. Further, instead of using "explain scientific phenomena" the following expressions are used: to interpret, to apply that knowledge, to test a hypothesis, and to use various graphs and algebraic models in explaining. Finally, instead of using "draw evidence-based conclusions" the following expressions are used: to make conclusions, to formulate simple models, to make generalisations and to provide capabilities for making everyday choices. (Lavonen, 2008)

Another important area in the National Core Curriculum (FNBE, 2004) from the point of view of PISA Scientific Literacy Assessment is content areas presented in the curriculum. In PISA 2006 (OECD, 2006), scientific literacy encompasses both knowledge of science (knowledge of the different scientific disciplines and the natural world) and knowledge about science as a form of human enquiry. The former includes understanding fundamental scientific concepts and theories; the latter includes understanding the nature of science. Lavonen (2008) has compared the description of knowledge in the PISA 2006 Framework to the content areas presented in the National Core Curriculum for Basic Education 2004 (FNBE, 2004). The contents of biology, chemistry, physics and physical geography, described in the National Core Curriculum for Basic Education 2004 (FNBE, 2004) belongs especially to the physical systems, living systems, earth and space systems and technology systems of the PISA 2006 content areas. In particular, the structure and properties of matter and chemical reactions; waves, electricity, motion and forces, energy and its transformation, basics of astronomy; humans, populations and ecosystems; Earth's history, space and change in Earth systems and issues concerning how biology, chemistry and physics knowledge are applied in technology and health care, in solving environmental issues and in everyday life, all mentioned in the PISA 2006 content area list are all core content of Finnish school biology, chemistry, physics and physical geography.

Moreover, in the National Core Curriculum for Basic Education 2004 there are several expressions, which give guidelines of how to increase students' knowledge

about science. The PISA framework identifies two categories of knowledge about science: "Scientific enquiry" and "Scientific explanations". In the list of Finnish aims, there are several examples of aims for both categories. In particular, the asking of scientific questions, models and modelling, taking measurements, observations and investigations belongs to the first category; whereas, presentation of types of scientific explanations (hypothesis, scientific law, model, and theory), formation of knowledge and outcomes of research (new knowledge, new methods, new technologies, new investigations), belong to the second category.

To summarise, the, aims for science education and contents described in the *National Core Curriculum for Basic Education 2004* (FNBE, 2004) are very compatible with the competencies described in the PISA 2006 framework (OECD, 2006). The Finnish science curriculum seems to emphasise inquiry activities where the students can identify, recognise or observe scientific issues, design experiments, gather empirical data or they use written sources of information, explain or interpret data or scientific phenomena, and draw conclusions based on the evidence or formulate simple models or generalisations. The curriculum guides teachers to organise activities where the students make observations or collect data and present the data as a graph and then give a scientific explanation.

SCIENCE TEACHERS

Primary (class) teachers (grades 1 – 6 in primary school) and secondary (subject) teachers in lower and upper secondary schools (grades 7 – 12) are educated on master's level programmes at universities. Primary teachers are qualified to teach all 13 school subjects in primary school, whereas secondary teachers typically teach two subjects in lower and upper secondary school. Primary school teachers are masters of education having 12 – 18 ECTS studies in science education (University of Helsinki). Even the science education courses in the primary school teacher education programme emphasises pedagogy, some subject knowledge is integrated in teacher education. However, there is very limited time for subject knowledge in the primary teacher curriculum. Lower secondary school teachers have master's (of science) degree. The following focus on describing lower secondary school teacher education programme. It is common in the Finnish teacher education programmes that about 5 – 9 ECTS are allocated for learning the pedagogy of science. The programme does not emphasise subject matter knowledge but more general teaching, planning, assessment and academic skills.

Biology, chemistry, physics and geography teacher education is organised in co-operation with the Faculty of Science/Bioscience and the Faculty of Behavioral Sciences (Faculty of Education). Studies are divided into two parts: the subject is studied at the department of the particular subject (e.g. physics) and the pedagogical studies at the department of teacher education. In the

subject teacher education programme students take a major and a minor in the subjects they intend to teach at school as well as minor in education (for more detail see Lavonen, Krzywacki-Vainio, Aksela, Krokfors, Oikkonen & Saarikko, 2007).

During the subject studies the students participate in university level undergraduate courses at the subject department. These courses aim to help students to develop a deep understanding of subject matter knowledge and concepts as a part of a conceptual framework of the subject. The advanced study courses introduce the students, for example, to the central notions of science, its epistemology and methodology and the interaction between science and technology, conceptual and process structures of the main areas of school physics and chemistry, methods for planning and carrying out experiments and demonstrations in the physics and chemistry classroom, the history and philosophy of science and its relations to society and technology (Lavonen, Jauhiainen, Koponen & Kurki-Suonio, 2004).

With the master's level studies in science subject, the pedagogical studies provide the teacher qualification. Pedagogical studies have three main components: 1) basic studies in education (social, philosophical, psychological, sociological, and historical basis of education), 2) science education studies including small scale research i.e. science teaching methods and issues considering learning, attitudes, motivation and interest), and 3) teaching practice in university training school and/or in field school. Cross-sectional themes are that future teachers are able to reflect broadly on their own personal pedagogical "theory" or assumptions made in their own work, and have the readiness for lifelong professional development being able to critically read the educational research literature.

According to PISA 2006 School Questionnaire data, 97.2% of the schools reported that there was no serious lack of physics, chemistry, or biology teachers (OECD 81.9%). Newly graduated geography teachers even have difficulties to find a job. On average 10% of the full-time teachers, in the schools that participated in the PISA 2006 survey, did not have an appropriate qualification. Consequently, in most of the schools there were highly educated and qualified teachers with deep subject matter and pedagogical knowledge. The reason for the very satisfactory situation of qualified teachers in the field might be that the teaching profession in Finland has had great public respect and appreciation (Simola, 2005). Teachers have independence in selecting the most appropriate pedagogical methods. Finnish teachers' levels of education have significantly increased during the last 30 years. Teachers have master's degrees, therefore they are educated to be autonomous and reflective academic experts and consequently the need for inspectors, national evaluation of learning materials or national assessment vanished. There have been no inspectors since the 1980s, no national evaluation of learning materials since the 1990s and no national assessment. Teachers have a lot of responsibility for pupils' learning. (Lavonen, 2008). At the same time the teacher profession, especially at the primary level, is also very popular and teacher-education departments can

select from among the nation's best students and highest scorers in university entrance examinations (Jakku-Sihvonen & Niemi, 2006). Science teacher studies are not as popular as class teacher education studies. Science teacher students and future scientists study the same courses in the subject departments typically for the first three years. Still, enough science teachers have graduated.

The PISA 2006 school questionnaire results support the argument that Finnish teachers have more professional autonomy than on average in OECD countries. The participating Finnish schools reported that school principals together with teachers are heavily responsible for disciplinary and assessment policy at the school level such as selecting the textbooks (100%, OECD average 83.5%), determining the course content (70.1%, OECD average 65.9%), and deciding which courses will be offered (90.1%, OECD average 69.9%). (Lavonen & Laaksonen, 2009) In Finland, assessment is concentrated at the school level and primarily implemented by teachers. It is plausible that this 'decentralisation' allows teachers to reflect on teaching and learning in their classrooms: they can choose how to use different forms of assessment suitable for each situation, such as students' self-evaluation, formative assessment of students' experimental work as well as summative assessment. In general, teachers are valued as experts in curriculum development, teaching, and assessment at all school levels (FNBE, 2004).

SCIENCE TEACHING AND LEARNING AT SCHOOL

The national curriculum (FNBE, 2004) requires that students should learn science process skills. Therefore, in Finland, practical work and demonstrations have long been accepted as an integral part of teaching and learning science subjects. Instead of notions of 'investigation' or 'inquiry', terms 'practical work' and 'demonstration' are used. The former emphasises students' hands-on activities and latter emphasises students' mind-on activities.

The concept "teaching method" is used in Finland as a synonym for a learning or instructional method/model/strategy or pupil activity or classroom practice designed to help pupils acquire concepts, ways of thinking, skills and values. Teaching methods are goal oriented and emphasise social interaction between pupils and teachers and between pupils (Leach & Scott, 2000, p. 54).

Juuti, Lavonen, Uitto, Byman, and Meisalo (2010) reported survey results of how students perceived the frequencies of certain science teaching methods. The data gathering followed a similar procedure as PISA 2003. In all, 3626 9th grade level pupils (aged 15-16) answered the questionnaire. According to students' perceptions, science lessons seem to be rather traditional. Direct teaching, solving basic problems, reading textbooks, and conducting practical work are often used. Classes seldom visit industrial sites and almost never visit museums. Because of the nature of biology and geography as disciplines, it is plausible that in biology and geography field studies and other out-of-school learning are more frequent

than visits in chemistry and physics. One unexpected finding, especially as they are rather easy to organize, is that there are no visits made by experts to the science classroom. The results of our survey are consistent with science lesson observations and principal interviews in 50 lower and upper secondary schools by Norris, Asplund, MacDonald, Schostak & Zamorski (1996). They concluded that (a) Finnish physics and chemistry teachers are pedagogically conservative and (b) teaching and learning is traditional, mainly involving direct teaching of whole groups of students.

According to survey reported Juuti et al. (2010), students did not desire major changes in teaching methods. However, the majority of students desired more small-group discussions and also more debates, which are understood to increase interaction between students. The findings of the survey indicate that there is a need for a larger variety of science teaching methods in Finland.

The students participating in the PISA 2006 Scientific Literacy Assessment were asked in the Student Questionnaire: "When learning school science topics at school, how often do the following activities occur?" The description of activities and communication in the questionnaire were written according to what is known to support learning processes in general and what type of descriptions are easy for students to understand the activity or communication in their science classroom. Students answered by ticking the appropriate box on a four-point Likert scale, the extreme categories being In all lessons and Never or hardly never. (OECD, 2005b)

In the questionnaire, there were altogether 8 items measuring the frequency of different types of communication, such as student discussion or the teacher explaining how different science ideas are applied to different phenomena; and 9 items measuring the frequency of different types of science activities, such as students do experiments or the teacher gives a demonstration. In order to reduce the number of items Lavonen and Laaksonen (2009) constructed sum-variables as described in Table 2. However, some of the variables consist of one variable, like "Student discussion" and "Demonstration". For example, the sum-variable Student ideas and opinions are listened is calculated based on the original PISA items "ST34Q01 Students are given opportunities to explain their ideas" and "ST34Q05 The lessons involve students' opinions about the topics". Both items measure student opinions about their possibilities to express their ideas and how these ideas are listened to. The sum-variable Practical work is calculated based on items "ST34Q02 Students spend time in the laboratory doing practical experiments" and "ST34Q14 Students do experiments by following the instructions of the teacher". In Finland the most typical student activity is a practical experiment where they follow the instructions of the teacher or a laboratory guide prepared or selected by a teacher. To evaluate the internal consistence of the sum-variables, Cronbach's Alpha (α) for each variable was calculated. The Alphas were between 0.81 and 0.82, thus confirming that the sum-variables were internally consistent.

Table 2. Sum-variables measuring students' opinion about type of communication and science activities in Finnish science classrooms.

	Finland		OECD		*d* *)
	Mean	S.D.	Mean	S.D.	
Communication (scale: 0 = Never or hardly never, 100 = In all lessons,					
Student ideas and opinions are listened ($\alpha = 0.82$)	55.9	24.7	54.6	26.4	0.05 [A]
Teacher explains (teach) ($\alpha = 0.81$)	43.2	19.0	46.9	22.5	-0.18 [A]
Student discussion	41.9	27.3	45.2	29.5	-0.12 [A]
Student debate	26.2	24.2	40.8	28.7	-0.55 [C]
Science Activities (scale: 0 = Never or hardly never, 100 = In all lessons)					
Students draw conclusions	52.2	27.1	50.5	29.6	0.06 [A]
Practical work ($\alpha = 0.82$)	41.6	20.9	38.7	23.4	0.13 [A]
Demonstration	33.7	24.8	40.1	27.7	-0.24 [B]
Students applying and modelling	36.3	23.8	36.1	28.2	-0.01 [A]
Science inquiry ($\alpha = 0.82$)	18.2	16.3	26.1	21.1	-0.42 [B]

*) [A] no effect ($d < 0.2$), [B] small effect ($0.2 \leq d < 0.5$), [C] moderate effect ($0.5 \leq d < 0.8$), [D] large effect ($d \geq 0.8$).

Finnish students consider that they frequently perform experiments and practical work by following the instructions of a teacher (or a workbook). Both teachers and workbooks guide students to make conclusions from experiments they have conducted. These activities happen on average more frequently in Finland than in OECD countries. Teachers also actively present demonstrations, and students are seldom, in fact almost never, allowed to design their own experiments or do investigations to test their own ideas. Students in other OECD countries report these kinds of activities more frequently than Finnish students do.

Finnish students think that in most lessons they are given opportunities to explain their ideas and express their opinions about topics. In the classroom, a class debate or discussion occurs in some lessons. Finnish students seem to value the interaction with the teacher instead of that in small groups or independent activities. Teachers frequently explain how science ideas can be applied to a number of different phenomena and for understanding the world at large. Students also encountered the relevance of "broad science" concepts to their lives through explanations by their classroom teachers.

In Finland, attempts have been made to avoid transforming science education aims into the form of intended learning outcomes in order to raise the quality of teaching and learning. In accordance with this, it is stated in the NCCBE that "The assessment is to address the pupil's learning and progress in the different areas of learning" (FNBE, 2004). Consequently, a teacher is responsible for assessment and student grading. In addition to this type of school-based assessment, local

authorities need assessment data for distributing educational resources and especially, for allocating more support for low achieving schools. For this purpose, they need to monitor learning outcomes through sample-based testing as a basis for decision-making. On a national level, the authorities have organized infrequent monitoring of learning outcomes in mathematics and Finnish language at the compulsory education level based on a representative sample, in order to evaluate educational policy and to improve schooling in general. However, in practice, Finnish teachers and schools are not controlled by external evaluation. The education authorities and national-level education policy-makers trust teachers and their professionalism: teachers are allowed to decide how to provide good education to all kinds of children and adolescents. Furthermore, mutual trust also exists between teachers and parents.

DISCUSSION

According to the PISA 2000, 2003, 2006 and 2009 data, it could be argued that Finnish students have performed extremely well in the PISA Scientific Literacy assessment, the number of low achieving students is the smallest and number of high achieving students highest in OECD countries and the variation between students and schools is the smallest (Lavonen & Laaksonen, 2009).

After the first PISA 2000 assessment the PISA researchers explained the Finnish students' success in PISA through comprehensive school pedagogy, students' own interests and leisure activities, the structure of the education system, teacher education, school practices, and Finnish culture, or in short – pedagogical philosophy and practice (Välijärvi, Linnakylä, Kupari, Reinikainen & Arffman, 2002). The same arguments were given after the second PISA 2003 assessment results. Furthermore, the same reasons for success also appear to be the explanations for success in the 2006 and 2009 Scientific Literacy Assessment. In the 2006 assessment some new data were acquired concerning students' activities and communication in science classroom. In this discussion the reflections are mainly based on the PISA 2006 data.

Based on the PISA Student Questionnaire data (Table 2) the role of the teacher in a Finnish science class is rather similar to that in OECD countries except in organising smaller number of science inquiry activities than in other OECD countries. Finnish "old fashioned" science teaching has led to excellent performance in the PISA tasks. One possible interpretation for this is that pupils perceive as being positive the fact that new concepts are introduced by a teacher, an expert, who first presents new information and then demonstrates how this information is used for solving problems or performing tasks.

Nevertheless, this does not mean that only teachers speak in classes, as there are also teacher-led discussions in science classes. Apparently, it is important that explanations of the discovered phenomena are presented and that conclusions are formulated, as well as their relevance to everyday life being shown built on the

concepts, under the guidance of an expert (Bransford & Donovan, 2005). This works if the teacher has a central role in the classroom, which is also accepted by the majority of the students. There is evidence at least at the primary school level that traditional teacher-centred instruction seems to result in higher academic performance than student-directed learning (Chall, 2000). Socio-cultural ideas of learning have too often focused on pupil – pupil interaction without paying attention to the fact that a teacher has a crucial role in acculturating pupils to the scientific way of thinking (Scott, 1998). This dialogical teacher – pupil interaction requires the teacher to have high subject knowledge. (Scott, 1998).

In general, Finnish teachers have been named as an important reason for Finnish students' success in PISA. Recently, Auguste, Kihn and Miller (2010) analysed teacher education in the top-performing PISA countries—Singapore, Finland, and South Korea. They explained that the success of the teacher education was due to successful recruitment procedures and programmes. The studies support the student teachers' process of becoming a teacher and building the knowledge base they need to act as autonomous actors in the teaching profession. They are able to plan, implement and assess learning outcomes independently.

One important reason for the good PISA science results is the similarity between the aims for the physics, chemistry and biology education in the national level guidelines, the National Core Curriculum for Basic Education 2004 (FNBE, 2004), and the competencies described in the PISA 2006 framework (OECD, 2006; Lavonen, 2008; Lavonen & Laaksonen, 2009). The curriculum emphasises activities, where the students can identify scientific phenomena, explain and interpret data related to scientific phenomena, as well as draw conclusions based on evidence. In Finland, practical work and demonstrations are an integral part of teaching and learning science subjects. However, the basic decisions about the national level guidance were decided some ten years before the first PISA framework.

As Table 1 illustrated, In Finland there is altogether, on average, 6 lesson hours per week allocated for science – taught by a teacher with a master's degree in the respective subject, such as in physics, chemistry or biology. This number of weekly lesson hours is relatively high when compared internationally (Waddington, Nentwig, & Schaze, 2007).

The science textbooks are designed based on the national core curriculum and are, therefore, also very compatible with the competencies and contents described in the PISA 2006 framework (Lavonen, 2008). The workbooks guide students to draw evidence-based conclusions and explain scientific phenomena. Nevertheless, these kinds of similarities certainly exist in several other countries as well. Consequently, teachers as implementers of the national level guidance and users of textbooks have a great deal of freedom in decision making. The teachers can concentrate on the issues they know well or feel are important to emphasise. This is possible due to the absence of inspectors and national level testing.

According to PISA Student Questionnaire data (Table 2) and previous research, practical work is often performed in Finnish science classes. However, especially in Finland, students are not allowed to design their own experiments or choose their own investigations. Using terminology introduced by Gengarelly and Abrams (2009), practical work in Finnish science classrooms can be described as guided or structured inquiry. Based on the PISA data, it is therefore to be concluded that also students, guided by a teacher, learn important competencies as evidenced by PISA, such as to identify scientific issues, explain scientific phenomena, and draw evidence-based conclusions.

Finnish students have succeeded very well in the cognitive items of the PISA 2000, 2003, 2006 and 2009 Scientific Literacy Assessment and, therefore, it is appropriate to continue with a similar science education policy and its implementation (Schleicher, 2006). In particular, there were no gender differences in the PISA score and low achieving students were achieving much higher PISA scores than similar students in other OECD-countries. Furthermore, Finnish education policymakers should be very proud of the very low variation in PISA scores, especially in the variation between schools.

A future challenge is the students' lack of personal relevance of science. A large majority of secondary school students participating in the PISA 2006 Scientific Literacy Assessment survey considered science to be important for understanding the natural world and that it usually improves people's living conditions. However, only half of them considered science to be especially relevant to them personally, and even fewer would like a career involving science. Perhaps, it would be important at the policy level to emphasise increasing students' interest towards school science and science in general – even though the Finnish PISA score might decrease.

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APPENDIX

Comparison of Finnish National Core Curriculum aims with PISA framework. Content related to the Pisa 2006 framework are highlighted with a bold typeface.

Examples of aims for learning science subject matter:

- In grades 5-6 progress is made towards the basic concepts and principles of biology, chemistry, physics and physical geography.
- The task of chemistry instruction in the seventh through ninth grades is to guide the pupil in **applying that knowledge** in different life situations.
- In grades 7-9 the pupils will learn in physics to use appropriate concepts, quantities, and units in describing physical phenomena and technological questions.
- learn to use concepts and methods of information acquisition and research that are characteristic of biology

Examples of aims for learning scientific methods:

The pupils will learn in physics and chemistry in grades 5-6

- scientific skills, such as the **formulation of questions** and … ,
- to make, compare, and classify **observations**, measurements, and **conclusions**;
- to **present and test a hypothesis,**
- to process, present and **interpret** results,
- to **formulate simple models**, to use them in **explaining** phenomena,
- to **make conclusions** about their **observations** and measurements and **recognise** the causal relationships associated with the properties of natural phenomena and objects,
- -to carry out simple scientific experiments clarifying the properties of phenomena.

The pupils will learn in biology and physical geography in grades 5-6

- to **observe** and investigate nature outdoors
- **identification** of the main flora and fauna in nearby areas,
- to make, compare, and classify **observations**, measurements, and **conclusions**;
- learn to use and interpret physical and thematic maps and to use other sources of geographic information, such as diagrams, statistics, literature, news sources, electronic messages, and photographs, including aerial and satellite photograph
- to understand the effects of planetary events on the earth
- to carry out simple scientific experiments clarifying the properties of phenomena, organisms, substances, and objects, as well as the correlations among them.

The core task of physics instruction in grades 7-9 is to strengthen pupils' skills in the experimental acquisition of information. In addition to the aims already presented above for grades 5-6, the pupils will learn in physics in grades 7-9

- to present and interpret results,
- to plan and carry out a scientific investigation in which variables affecting natural phenomena are held constant and varied and correlations among the variables are found out,
- to evaluate the reliability of the research process and results,
- to use various graphs and algebraic models in explaining natural phenomena, making predictions, and solving problems.

The instruction in chemistry for grades 7-9 relies on an experimental approach in which the starting point is the observation and investigation of substances and phenomena associated with the living environment. The pupil progresses from that point to the **interpretation**, **explanation**, and **description** of phenomena, and to **modelling both the structure of matter and chemical reactions** with the

symbolic language of chemistry. In addition to the aims already presented above for grades 5 - 6, the pupils will learn in chemistry at grades 7-9

- to **acquire knowledge** in different life situations,
- to **interpret** and present the results,
- to use research methods typical from the standpoint of **acquiring scientific knowledg**e,
- to carry out scientific investigation,
- to evaluate the reliability of the research process and results.

Biology instruction in grades 7-9 must be inquiry-based learning and it is to develop pupils' thinking in the natural sciences. The objective of the instruction is to give pupils the ability to observe and investigate nature. In addition to the aims already presented above for grades 5 - 6, the pupils will learn in biology in grades 7-9

- to know the basic concepts and processes of human biology and genetics,
- structure of ecosystem and examples of ecosytsems
- to **identify** the main species of plants, fungi, and animals in the pupils' home region as well as biodiversity,
- to **recognise** environmental changes in the pupils' home region.

In geography instruction in grades 7-9 the world and its various regions and regional phenomena come under investigation. The instruction is to develop the pupil's geographical conception of the world, and the regional foundation of that conception. The objective of instruction in geography is to develop the pupil's ability to examine the natural, built, and social environments, and the interaction between people and the environment, from the local to the global level. The pupils will learn in geography in grades 7 – 9

- -to use and interpret physical and thematic maps and to use other sources of geographic information, such as diagrams, statistics, literature, news sources, electronic messages, and photographs, including aerial and satellite photographs

Examples of aims for learning the nature of science:

- In grades 7-9 the core task of physics instruction in the seventh through ninth grades is to broaden the pupils' conception of the nature of physics. The instruction guides the pupil in thinking in a manner characteristic of science, in acquiring and using knowledge, and in evaluating the reliability and importance of knowledge in different life situations. The purpose of the experimental orientation is to help the pupils to perceive the nature of science.
- Biology instruction must be inquiry-based learning and it is to develop the pupil's thinking in the natural sciences.

Examples of aims for stimulating the pupils' interest to study science subjects:

- In grades 5-6 the instruction must stimulate the pupils to study science.
- In grades 7-9 the purpose of the experimental orientation is to stimulate the pupils to study physics and chemistry.

Examples of aims for stimulating the pupils to become familiar with society and decision making:

- In grades 5-6 the instruction must stimulate the pupils to take care of their environment and act responsibly in it.
- In grades 7-9 the instruction in physics helps pupils' understand the importance of physics and technology in everyday life, the living environment, and society. It also **provides capabilities for making everyday choices**, especially in matters related to environmental protection and the use of energy resources.

Examples of aims for cooperative skills development:

- In grades 7-9 the purpose of the experimental orientation is to help pupils to learn cooperation skills. The pupils will learn in physics to work and investigate natural phenomena safely, together with others.

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10. LANGUAGE AND LITERATURE EDUCATION:

Principles and Reflections on Mother Tongue and Literature

ABSTRACT

Mother tongue and literature is taught at every stage of Finnish education, from preschool to universities, and, according to international assessments, with success. This article focuses on teaching and learning mother tongue and literature in basic education. The core of the subject is the interrelation between language and literature studies which opens up a diversity of thematic fields. This fact is elaborated with the help of an example, a fictional story by a Finnish writer, accompanied with school exercises typical for this subject. For background information, we first introduce the linguistic situation in Finland with a growing number of pupils and students learning Finnish as a second language. After elaborating on the principles and aims of the subject, we finish by reflecting on the training of teachers of mother tongue and literature, as well as pointing out the significance of high quality teaching materials and in-service training organized by the association for mother tongue teachers.

INTRODUCTION

The aim of our article is to give an overview of the subject mother tongue and literature, and to elaborate on its basic principles and aims.[1] In the following, we first describe the core curriculum of the subject mother tongue and literature (Finnish), showing the diversity of thematic fields in, and the significance of this subject for all learning skills in comprehensive school. One of our main points is to describe the intimate interrelation between language and literature studies that form the core of the subject. This is, to our mind, one of the reasons for Finnish pupils' continuously high success in literacy skills in international assessments such as PISA (see Hautamäki *et al.,* 2008). Second, we describe concretely the variety and the innovative practices that are available for teachers of this subject. With the help of a short story written by a prominent contemporary author Hannele Huovi, we show how teachers in Finnish classrooms are able to create pedagogy that

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 149–160.
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combines the development of their pupils' skills for reading, writing, and expressing themselves verbally, with the development of skills for analysing different texts and literature from the perspectives of literary analysis, linguistics and drama. Third, we finish our article by describing how teachers of this subject have rich possibilities for developing their professional skills, for example, through in-service training and the activities organized by the associations of mother tongue teachers.

THE LINGUISTIC SITUATION IN FINLAND

Finland has two national languages, Finnish (90% of the population) and Swedish (5.4%). In addition, Saami languages (0.03% of the population)[2] hold a special status ensured by law in certain Northern Finnish communes. In the framework of basic education, there are also two other mother tongues, Romany and Finnish sign language, that have a similar position in the National Curriculum. This means that the first part of the subject called mother tongue and literature may actually mean a choice of different mother tongues: Finnish, Swedish, Saami, Romany or Finnish sign language[3] (see National Curriculum, 2004). This is in line with the New Language Law launched in 2004 (see Nuolijärvi, 2005; Mantila & Sulkala, 2010).

Finnish is spoken in all parts of Finland, and the speakers of Swedish live mostly on the western and southern coasts. As stated above, Saami is spoken in Northern Finland, and it has its own minority language law.[4] This ensures, for example, that Sami speakers have a right to get their basic education in Sami in certain regions of Lapland. Speakers of Saami also have the right to use their mother tongue in, i.e., health care and in legal and official matters.

In addition to the above-mentioned languages that hold a special legal position, there are about 80 other languages in Finland that have more than 100 native speakers. The biggest language groups are Russian (approx. 54000 speakers), Estonian (approx. 28000), Somali (approx. 13000) and Arabic (approx. 10000).[5] Linguistic research has quite straightforwardly shown that the key factors for the successful learning of a second or foreign language lies on the skills and knowledge of a learner's own mother tongue (*e.g.* Cummins, 1976; 1978; Klein, 1986; Doughty & Long, 2003). This means that the better you know your own language, the better are your chances to learn another language. In basic education, each pupil has the right to get tuition in his or her own mother tongue (National Curriculum 2004, p. 95). For pupils whose mother tongue is not Finnish or Swedish, learning their own language is voluntary. However, they should also learn either Finnish or Swedish as a second language (National Curriculum 2004, p. 42). All the other subjects in comprehensive school are taught in Finnish or Swedish, this language choice depends on the official language of the school. This is one reason why pupils should achieve basic skills also in the language of their comprehensive school. If and when their language skills in Finnish or Swedish are

good enough, these pupils may also choose to learn Finnish or Swedish as their mother tongue.

Understandably, the great majority of pupils in Finland learn Finnish as their mother tongue. In this article, we focus on describing the subject mother tongue and literature from the point of view of Finnish as the mother tongue. It should be noted that the pedagogy and didactics in the frameworks of other mother tongues are designed along the same lines.

MOTHER TONGUE AND LITERATURE

Mother tongue and literature is one of the basic subjects of comprehensive school in Finland: its main aim is to teach pupils those significant skills that are fundamental for all learning in school, namely literacy skills, including, first of all, the technical skills for reading and writing. Mother tongue and literature is one of the prominent subjects in comprehensive schools, as well as in secondary schools, also in terms of the time devoted to it. The division of teaching hours devoted to different subjects is described in the National Curriculum, and mother tongue and literature is studied in every grade, having a minimum for total weekly lessons per year of 42 hours (National Curriculum 2004, p. 298). This means that mother tongue and literature has more lessons than any other individual subject in comprehensive school. It is also the only compulsory subject in the national matriculation examination test at the end of upper secondary school.[6]

The main task for mother tongue and literature is to get pupils interested in language, literature and interaction – mother tongue is both an object and a tool for learning. Literacy skills are approached from the social cultural perspective: the objective is that the pupil "becomes an active and ethically responsible communicator and reader who gets involved in culture and participates in and influences society" (2004, p. 44). Mother tongue and literature is based on three main fields, those of linguistics and the study of literature as well as communication studies. In addition to these, this subject rests also on the studies of folklore, theatre, drama, and media. As mother tongue and literature is described as "an informational, artistic and skill subject" whose aim is to help the pupils to build up their identity and self-esteem, a lot of effort is directed towards developing the pupil's analytical and artistic imagination through examining texts from various points of view.

In the National Curriculum, the core contents of mother tongue and literature are categorized in the final grades (6–9) under five dimensions: interaction skills, text comprehension, preparing compositions and spoken presentations, information management skills, and relationship with language, literature and other culture (National Curriculum 2004, pp. 52–53). The pupils should have, for example, developed the courage and confidence to communicate and express themselves in various contexts both orally and in writing. They should have developed skills to understand and critically read different kinds of texts while paying attention to the

genres, styles, textual structures, and linguistic choices as well as the informational contents that are shaped by the sources of information and the media of publication. The pupils should also have basic knowledge of the history, structure, and variations of the Finnish language, and of the language situation both in and outside Finland. In addition, the pupils should also have knowledge of the history and variations of Finnish literature as well as skills to analyse the structures, genres, and meanings of fictional texts in their contexts. (See more in National Curriculum, 2004.) The underlying idea is that through learning these contents and skills, the pupil becomes an optimistic and self confident individual and a member of society who values human rights and democracy and wants to take an active role in developing her society, and who, above all, enjoys and appreciates her mother tongue, literature, and culture.

In the tuition of mother tongue and literature, special education is already emphasized from the first class. Pupils with particular problems and learning difficulties get extra lessons from the special education teacher and individual help from a special-needs assistant. In this way, the specific needs of pupils are taken into account in the whole teaching and learning process.

The interrelation between language and literature studies in Finnish mother tongue education is due to the fact that both the history of written Finnish and the history of education were promoted at first by the same actors not very many centuries ago. The first book in Finnish was published in 1543; it was an ABC-book, written by the developer of written Finnish, the Lutheran bishop, Mikael Agricola. The educational projects in Finland were quite successful. Already in the middle of the 18th century 30-50% of the Finnish population were able to read, and in 1880 already 98% of the population were literate (Kauppinen, 1986, p. 23; Hakulinen *et al*., 2009, p. 17). This high percentage was due to the Lutheran church since it demanded that before individuals could get married they had to be able to read (Markkola, 2007). In the 19th century, the school system was developed independently, apart from the Lutheran church. Because of the political history of Finland – this region had either been part of the Swedish Kingdom or the Russian Empire becoming independent in 1917 – learning Finnish in school was not self evident at first. Finnish was allowed to be taught at schools as a foreign language in 1841 and as a mother tongue since 1856 (Hakulinen *et al.,* 2009).

At the beginning of the 20th century, new ideas in pedagogical thinking affected school curricula (Kauppinen, 1986). The methods and the materials of mother tongue instruction were designed to take into account the life and the natural interests of children to motivate them more in learning activities. Pupils were allowed to write stories by themselves instead of copying texts of distinguished writers; they were allowed to read fiction and other literature instead of only reading their text books (Kauppinen, 1986). The two main aspects of the subject were to learn Finnish grammar and to get knowledge of Finnish literature. This combination of linguistics and the study of literature has been the basis of the didactics of the subject mother tongue and literature; and this characteristic was

emphasized when its name was changed in 1997 from mother tongue to mother tongue and literature.

ELABORATION ON SOME BASIC PRINCIPLES OF THE SUBJECT: CHAMELEON

The didactics of mother tongue and literature is designed to simultaneously serve the development of several skills in the framework of linguistics and literature studies. For example, a fictional short story can be a starting point for various exercises and pedagogies. Different kinds of reading strategies can be practised while examining a short story; it can be a starting point for exercises on writing (creative and analytical writing); it can be analysed both from the linguistics point of view (grammar, sociolinguistics, genre pedagogy) and the point of view of literature studies (as a representative of a literary genre; as a poetic text making use of tropes; as a text combining different narrative strategies, etc.); and, as a source of drama and oral presentations; or as a source for media texts, e.g. on the Internet. With various exercises the pupils' abilities in learning to learn, think and express themselves creatively and independently in their own social contexts develops and increases.

Next, we turn to one concrete example of such a text. We take one contemporary short story, Chameleon by Hannele Huovi (originally published in 2003), and give examples of tasks that could be given to pupils about it. Through this example, we aim to elaborate our argument about the tight bonds between tuition in linguistic and literary skills, and we also incorporate tasks making use of drama. We hope to demonstrate, how these skills can be simultaneously practised. We present first the text itself and then a list of various possible exercises from it that cover the range of fields and starting points referred to above. The exercises here are basically meant for grades 7 to 9 (13 to 16 year old pupils). They are built along the lines that are used in lessons and exercises presented in text books and in other teaching materials for these grades, and thus, they depict the actual practices of mother tongue and literature education in classrooms.

Chameleon

A new Director had come to the office.

'Time for a makeover,' the Director said and smiled broadly.

The chameleon smiled back. He was just running down the corridor and was exactly the same grey as the corridor wall's concrete. The Director did see the smile, however.

'This office is now in for a new development,' the Director said and smiled.

'Yes, overdue,' the chameleon said, and his skin began to show stripes in line with the director's pin-stripe suit. 'The times require new measures.'

'Work demands commitment,' the Director said.

He looked energetic and his slimline leather briefcase efficiently sliced the air. The chameleon's skin began to mimic the briefcase's metallic colours, and the Director gave the chameleon an approving look.

'Commitment, that's it,' the Director said and continued on his way without a glance back.

The chameleon stood in the corridor and sniffed the air. From the Fly Office's kitchen a smell of coffee was wafting into the corridor. He decided he'd have a cup before hastening off to his desk.

The lizards were sitting in the kitchen having coffee and looked dissatisfied. They were discussing the new situation, but the talk stopped when the chameleon opened the door. There was a piece of snake tail on the cake dish, and an iguana passed it to the chameleon.

'Thank you, but I only eat invertebrates,' the chameleon said, not even glancing at the snake tail. Gradually he began turning orange like the tablecloth.

'Everything's going to pot,' said a horned lizard and gave the newcomer a look. 'Before long nothing we do will do.'

One of the chameleon's eyes was looking east, the other west. The divergent gaze was confusing and began to disturb the horned lizard.

'Do you agree?' the lizard asked, checking up.

'Oh definitely! We need no reorganisation here,' the chameleon said, looking as angry and worried as the other lizards. He had a glow as orange as the tablecloth.

'Time for a revolt,' the horned lizard said.

Then, with one of his eyes, the chameleon saw the Director coming toward the kitchen. He concentrated himself and immediately his skin paled to a shade of grey. When the Director opened the door, he'd already developed a couple of pinstripes on his skin.

'Down to work,' the Director said, looking severe.

'I was just off,' the chameleon said smoothly.

He slipped off into the corridor while the others remained listening to the Director's announcement of the new coffee and meal times, commitment, the new corporate spirit, and the Fly Office's objectives for the year.

The chameleon settled down at his desk to lie in wait for insects. He immediately began toning in with the office colours; his thin skin started glowing green and brown and some orange spots formed on him. He got down to work, took up a correct posture on his office chair, grabbed the chair back with his tail and took tight hold of the chair legs with his forked toes. On one side of the desk sat a severe old iguana, and on the other a young trainee lizard. This little miss had dolled herself up nicely, and the chameleon absorbed some of the colour of her dress into his flank and gave her the glad eye. Both of the other two already had a pile of trapped insects in front of them. They'd been toiling at their desks all morning.

The chameleon's eyes wandered to both sides. Then he saw a fly. He concentrated both his eyes on the victim and began to sway to and fro. He studied his prey from each side and now and then his eyes rested on the glass window that showed the Director's office. Just as the Director came though his door the chameleon struck.

'Splendid,' the Director said. 'Excellent shot.'

The chameleon showed him the fly he'd nabbed on his tongue.

'Model yourself on this gentleman,' the Director said. 'Then things'll go well.'

The chameleon smiled contentedly and in an instant turned as silver-grey as the Director's tie. The old iguana looked cross, and the trainee missie was astonished the Director had taken no notice of the pile of flies she'd caught.

In the course of the day the chameleon did his best to fire off his tongue whenever the Director was walking by. He was praised for this several times, even though his whole catch was not particularly great. At the end of the day the insects were weighed and packed and sent for sale. The new Director was pleased.

The chameleon had had to change colour many times during the day, sometimes to suit the Director, sometimes his colleagues. He'd reproduced the office wall and the corridor; in the Fly Office Shop he'd turned as multicoloured as the shelves of canned food; and, working-out in the gym in the evening, he'd tried to make his skin shine like the skins of those sweating around him.

He arrived home absolutely fagged out. He felt as if he'd never manage to be a chameleon for one more day. Changing colour wore you out.

But when he woke the following morning, a sunray fell on the tip of his tail, and it turned as yellow as a sunlit branch. The chameleon couldn't give up.

The secret of mutability is flexibility.

(Translated by Herbert Lomas, in Books from Finland 2/2004.)

Exercises:

1. The story represents a literary genre called the fable, dating back to the antiquity. Find out facts about the genre and bring to mind other fables you might know. What is typical for them and how well does the short story Chameleon fit the genre?
2. Write the short story anew from a different perspective, changing the narrator into the Chameleon himself or one of the other characters (the Director, one of the iguanas, or the young trainee lizard).
3. Explore the style of the short story.
    a. Select finite verbs used in the text, and replace them with their synonyms. What happens to the story and the characters?
    b. Select the nouns, and add adjectives to noun phrases. What happens to the milieu and the characters?
    c. Combine the clauses in the paragraphs with several clauses into one sentence. What kind of observations can you make of the rhythm of the new text and the atmosphere in it?
4. Read carefully the original short story in Finnish and compare it to the translation in English. In the English version, the sex/gender of the characters is openly revealed (with the choice of the personal pronouns he/she). In the Finnish version, due to the genderless character

of the personal pronoun system in Finnish, the sex/gender of the characters is revealed more implicitly. Analyse the linguistic ways in which the characters get their sex/gender in Finnish. Is the sex/gender of the Director unambiguous?

5. The short story ends in a motto. How do you understand it? Write short mottos for different characters in the story (Chameleon, Director, old iguana, young trainee lizard), describing their principles and values of life.
    a. How would you describe your own motto for life? Write your mottos on the board and discuss them.
    b. Compare the way of life in the short story and in your community, at school or your network of friends. What is different, what is similar? Can you formulate mottos for basic principles in these different surroundings?
6. Summarize the happenings of the story into a poem (a haiku or a tanka, for example).
7. Imagine that you are the Chameleon and write the following tasks in this role.
    a. Make a Facebook profile for the Chameleon. What kind of groups does he belong to? Who are his friends? What kind of music etc. does he like?
    b. Describe the happenings of the day by writing 5-10 updates of it on your Facebook profile. You can also add comments on them written by the Chameleon's friends.
    c. Write a blog text about your day.
8. Write an interview about the Chameleon (or the Director) in the staff magazine of the company where they work.
9. A volunteer takes the role of one character in the story and sits on a chair in front of the class. Others ask him/her questions about his/her feelings, decisions, and acts in the story and, if they want, also before/after it. The volunteer answers the questions.
10. The class is divided into groups of 4 to 5 pupils. In each group, one pupil is the Chameleon, and the others act as "inner voices" inside his head: the Chameleon remains silent and the inner voices speak out his thoughts in three different situations:
    a. when Chameleon first meets the new Director
    b. at the coffee table with the colleagues
    c. at home in the evening
11. The class is divided into groups of 4 to 5 pupils. Each group picks up three situations from the short story and presents them as "statues", silent pictures.
12. The class is divided into groups of 4 to 5 pupils. Each group makes a short (maximum) 5 minute play about a situation, when a "real-life-

Chameleon" comes to a new class and meets his/her classmates and the school headmaster for the first time.

Each exercise is followed by a group discussion about the results of the task and the feelings and opinions of the pupils. During these discussions the teacher sheds light on the aims of the exercises in the larger pedagogical framework.

TRAINING TEACHERS OF MOTHER TONGUE AND LITERATURE

The Finnish teacher education system is described elsewhere in this book, and therefore we will only briefly specify some characteristics of teacher education and in-service education in the field of Finnish language and literature. Usually, in grades 1 to 6 mother tongue and literature is taught by a class teacher, and in grades 7 to 9, where our focus lies in this article, by a subject teacher.

In our view, the very essence of a teacher's profession in Finland is independent expertise. Subject teachers of mother tongue and literature are treated as experts in their own profession, pedagogy, and subject didactics, not only by educational and administrative authorities but also by pupils, colleagues, and parents. All their teaching activities and collaboration with their teacher colleagues and their pupils' parents are based on this fact. This also means that teachers are free to choose the pedagogical methods and the teaching materials for their pupils by themselves, as long as they follow the guidelines described in the National Core Curriculum for Basic Education (2004). Finnish teachers are independent professionals and pedagogical authorities in their work (Harjunen, 2009).

All around Finland, there are local associations for teachers of mother tongue and literature. These associations organize seminars, lectures and meetings for their members. Their head organization, Äidinkielenopettajain Liitto (ÄOL; National Association of Mother Tongue Teachers; see, http://www.aidinkielenopettajainliitto.fi/index.html) is also a highly effective forum, which publishes a membership journal and other professional material, both in paper and electronic form, and offers professional help in different matters. Twice a year the association organizes a big 2–3 day seminar with distinguished guest lecturers, a large number of workshops and interesting cultural programme in the evenings. For a large number of – probably most – teachers of mother tongue and literature, these activities (local and national in-service education and participation in different activities, i.e. discussion templates offered by the ÄOL) form an essential part of their teacher identity and professional growth.

In the field of mother tongue and literature education, there is a vast amount of excellent teaching material available, published by all the prominent publishing houses in Finland. The percentage of electronic material is presently increasing and the topic is being vividly discussed among all publishers and text book writer groups. All text books come with a separate book and/or electronic material for the teacher, including additional background information, elaboration ideas, theory,

and teaching suggestions. Basically, teachers are free to choose those text book series that please them most, but actually the economic situation of the school and the opinions of teacher colleagues may set certain restrictions to that freedom (it is, for example, not always possible to use several text book series for different classes in the same grade). What must be stressed, however, is that there is no local or national authority which could decide or command the teachers to use certain materials or text book series.

Interestingly enough, subject teachers of mother tongue and literature are not very keen users of text books – with only some exaggeration one might say that the higher the grade the less the teachers use text books in mother tongue and literature education (Luukka *et al*., 2008). This, of course, is largely due to their own expertise stressed above, and because to this the role of a text book is rather seen as a background manual where the pupils and teachers are given basic facts in a compact form. A second reason obviously lies in the nature of the subject: teachers want to bring up-to-date texts (columns, news reports, interviews etc.) from newspapers and media to the classroom instead of using the same example texts in the text books year after year (Luukka *et al*., 2008, pp. 90–105). Of course, the nature of literary history is different, but as far as contemporary prose and poetry are concerned teachers also constantly seek out fresh examples. In some extreme cases, teachers have given up text books altogether and started using electronic material only. Preliminary results on these experiments show a remarkable growth in, especially, boys' motivation in writing, and a general positive motivation level among the whole test group in general (see Sinko, Pietilä & Bäckman, 2005, pp. 157–161, Heilä-Ylikallio & Häggblom, 2010). However, although Finland's PISA results have so far been good, recent national tests have shown worrying deficiencies especially in boys' writing skills and motivation (Harjunen *et al*., 2011).

As is clear in many articles in this book, the teaching profession in Finland has a strong academic basis, and teacher education relies on tight co-operation and interrelation between Departments of Teacher Education, subject departments and faculties, and teacher training schools as well as the national associations of teachers and the National Board of Education. Several times a year university staff and training school teachers meet in order to discuss courses and curricula, give feedback and envision further collaboration. In contrast to some other countries, university staff holds no authoritative or upper position to teachers working in the schools. On the national level, new curricula are launched approximately every 10 years, and all of these above mentioned parties are invited to take part in the development process of new curricula by the National Board of Education. Hence, this is an example that shows how close is the collaboration between different parties interested in and responsible for the development of mother tongue and literature studies in Finland. Through the national assessments (*e.g*. Lappalainen, 2011, Harjunen *et al*., 2011) and educational research and through the voices of

acting teachers and teacher educators the voices of school pupils are also valued and taken into account.

NOTES

[1] In this article, we use the term mother tongue, because it is the direct translation of the name of the subject and used also in the national curricula (National Curriculum 2004). In linguistic research, the term has been challenged and replaced, for example, by the concept of first language (e.g. Kecskes & Papp 2000).

[2] The statistics given here show the situation at the end of 2010, when the total population of Finland was 5.4 million (Statistics Finland, http://www.stat.fi/index_en.html; http://www.stat.fi/tup/suoluk/suoluk_vaesto.html.

[3] If a student's choice of mother tongue and literature is Sami or Romany, she also has to study Finnish or Swedish, and if the choice is Finnish sign language, she has to study Finnish/Swedish for users of sign language

[4] To be exact, Saami is not only one language but consists of 10-11 Saami languages that are spoken in Northern Scandinavia and the Kola Peninsula. The biggest and most widely spread language in the group is North Saami, which is also the mother tongue of most native Saami speakers in Finland, where two other Saami languages are also spoken. For further information, see The Saami – a Cultural Encyclopedia, http://bar-enc.didaktekon.se/Editor/Examples/Ex-Enc-Saami-1.pdf.

[5] The data dates from the end of 2010. For further details and exact numbers of speakers, see http://www.suomi.fi/suomifi/suomi/valtio_ja_kunnat/perustietoa_suomesta/vaesto/index.html; http://www.suomi.fi/suomifi/english/index.html.

[6] For information about the matriculation examination, see http://www.ylioppilastutkinto.fi/en/index.html

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11. LANGUAGE EDUCATION - FOREIGN LANGUAGES

ABSTRACT

This article focuses on describing the issues considered to form the basis for the current quality of foreign language teaching in basic education in Finland. This basis has its cornerstones in research-based teacher education and active networking between the different stakeholders in the field. We introduce the main aims and core contents of language teaching as well as the latest trends of pedagogical approaches, methods and role of assessment. We present descriptions of projects and networks set up to support the application of both the latest results of research on language education and the implementation of the national core curriculum at the local school level. The article concludes with a discussion of the challenges for future quality work in the field of language education in Finnish comprehensive schools. It is not enough only to maintain the current quality level but there needs to be an upgrading of quality.
Keywords: Language education, language teaching and learning, intercultural communication competence, language curriculum

THE CORNERSTONES OF THE CURRENT LEARNING OUTCOMES IN FOREIGN LANGUAGES

Introduction to the Current Situation

The number of people who speak the Finnish national languages, Finnish and Swedish, is very modest compared to e.g. bigger European nations and their languages. Finnish people as a nation need proficiency in a range of languages to be able to communicate and cooperate with people from different linguistic and cultural backgrounds both for business and pleasure. Even Swedish is in practice a foreign language in most of the country, because the Swedish-speaking minority (ca. 5%) is heavily concentrated on the western coast and southern Finland. Owing to this background, it is easy to understand that we are, and we have to be, committed to investing in language education in Finland. Foreign languages and the need for foreign language proficiency and intercultural communication skills have become, in one way or another, part of every Finn's everyday life - if not in face-to-face situations, at least through television because in Finland we enjoy the

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 161–176.
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benefit of everyday exposure to foreign languages while watching the television where the programmes are not dubbed.

During these past few decades starting from the 1970s, language proficiency, communicative competence and intercultural communication competence have become a joint European concern. For example, the Council of Europe is concerned to improve the quality of communication among the Europeans of different language and cultural backgrounds (CEFR 2001, xi, 3-6). In Finland, different stakeholders of language education have been actively participating in the development work in the field of language learning and teaching at the European level (e.g. use of the CEFR and ELP). Simultaneously with internationalization and globalization, the concept of language proficiency and the objectives of language education have been profoundly modified. Currently, language learning is seen as a lifelong task (CEFR, 2001).

Since the 1970s when the 9-year comprehensive-type basic school system was launched in Finland, the right and obligation to study foreign languages have concerned everybody from the beginning of the school path. In the current situation, language studies (minimally comprising of the mother tongue, the other national language, and at least one foreign language) are compulsory at each level of the Finnish school system. Foreign language studies are to start at the latest in the 3rd grade at the age of 9. The most often offered and studied first foreign language is English. In 2009, 90% of the 3rd graders, the age group being almost 58 000 children, started English as their first compulsory foreign language, while ca. 5% started Finnish and 1% Swedish. The proportion of pupils who began with German or French was about 1% in each language, while Russian and other languages attracted even fewer pupils. (Kumpulainen, 2010.) The most common set of languages studied by comprehensive school pupils is Finnish, Swedish and English.

The compulsory minimum of languages to be studied in comprehensive school is three languages: the mother tongue from the 1st grade on, the first foreign language at the latest from the 3rd grade on and the other national language, which for most of the (Finnish-speaking) pupils is Swedish, at the latest from the 7th grade on. In addition, there is an opportunity to choose an optional language from the 5th and/or 8th grade on, even though this option is not always available in all municipalities due to practical and economic reasons. All in all, in addition to Finnish and Swedish, pupils have an opportunity to study a maximum of three foreign languages in basic education. However, the proportion of pupils who make full use of this opportunity has been declining during the last few years. In 2010, foreign language studies were started already in the 1st or 2nd grade by only 14% of comprehensive school pupils and not more than 23.5% of the 5th graders studied two foreign languages (See *e.g.* Kumpulainen, 2010).

Referring to the title of this paper, foreign language teaching is, not only in Finland but internationally as well, in the process of a paradigm shift towards foreign language education (focusing on education) that integrates experiential and

sociocultural theories of learning (see *e.g.,* Kohonen, 2009). Language education emphasizes meaningful learning that is based on personal experience, social interaction and reflection. It aims at all-round human growth. This kind of approach inevitably poses new challenges for teacher's professional competences and teacher education to enable a new kind of interactive and collaborative learning culture in schools (Kohonen, 2009, pp. 16–26).

Research-based Teacher Education and FL Teaching

A Brief History of Foreign Language Teaching in Finland

In the following we will give a brief overview of the focal contents and highlights of language education as stated in the normative documents through the decades of general compulsory education. We will also describe how the core curricula were implemented across the local settings over time by prioritizing whatever methodical options were popular at any time for teaching and learning foreign languages and assessing the learning outcomes.

Before the onset of comprehensive education, compulsory and equal for all citizens, the educational system of Finland was characterized by parallel paths, strongly diversified in nature in terms of future qualifications they provided to the students. Prior to 1970, only the students attending a form of schooling targeted to more academic professions (lower and upper secondary schools) were provided opportunities to study foreign languages. The methodology was largely borrowed from the studies of classic languages favouring grammar, translation and the written mode in the teaching of even modern languages. Although the superiority of form over function is something of an unresolved issue still today, the ethos of language teaching and learning has undergone a profound change since those days. Since the mid 1970s, the language syllabi launched for the comprehensive school were inspired by the notional-functional models proposed to promote European mobility. Until the 1980s, these language syllabi also presented detailed lists of structures and situations intended to be followed by teachers. Such lists may be viewed as a top-down power distribution, downplaying teacher autonomy and continuing the behaviourist tradition of teaching and learning. However, the way for communicative competence as a goal for foreign language teaching and learning was paved for further elaboration. The communicative turn was manifested in new teaching materials including texts striving to convey everyday language use and promote speaking skills. The role of oral language proficiency grew in importance during the 1980s and 1990s along with an increased concern for autonomy issues, in regard to both teachers and students. Local curricula were derived from the national core content allowing teachers to find their own methodological priorities that fit local settings of learning. More attention was paid to pupils´ diversity and differing needs. Humanistic conceptions of learning eased the atmosphere of school learning and merged with the constructivist

mainstream that first materialized in the 1994 core curriculum. (Perusopetuksen opetussuunnitelman perusteet, 1994)

This core curriculum only stated the broad frame for teaching and learning and assigned teachers a large freedom of local interpretations and pedagogical choices. At the national level, both positive and negative consequences of the curricular freedom expressed in 1994 were detected. In some municipalities, the local curricula are of high quality and schools have profiled themselves to reflect and consolidate local collaboration. At the same time, in Finland where equal opportunities of societal progress have traditionally been highly valued, research findings point towards increased differences in learning outcomes between schools and regions in Finland (Hautamäki *et al*., 2000; Tuokko, 2007). Furthermore, teachers wanted more normative guidance for their work.

Main Aims Set in the Language Core Curricula

The recent cycle of curricular design at the dawn of the millennium sought to respond to a number of international, societal and pedagogical challenges. The need for removing obstacles of international mobility between countries has been noted well in Finland and Finnish language experts have actively participated in and benefited from the Council of Europe activities. These long-term enterprises have culminated in publishing effective tools for making language education more systematic, comprehensive and transparent. The Common European Framework of Reference for languages (CEFR, 2001) and the European Language Portfolio (ELP) along with the national versions (EVK, 2003; Kohonen, 2005) are among the most prominent of them, and they incorporate the yield of several decades of development work within the Council of Europe modern language project.

Language education in Finnish comprehensive schools is based on the National Core Curriculum for Basic Education (2004). It is a normative guideline for teaching and educational work providing the objectives and main content for various subjects. In foreign language instruction, a language is seen not only as a skill subject and means of communication but also as a cultural subject. The current version is from 2004 and a new cycle of curriculum modification is forthcoming. A broad range of stakeholders has already been consulted for the preparations. Concerning language education, the major agents involved are employer associations, diverse cultural groups and teacher associations as well as researchers.

The aims and evaluation criteria of the curriculum concerning foreign language teaching are based on the pan-European recommendations of CEFR (2001) which have been modified to suit the Finnish context (Finnish version of CEFR, 2001: EVK, 2003). The major reform in the 2004 core curricula was probably the adaptation of the CEFR proficiency level system to illustrate progress of language ability in different syllabuses (Hildén & Takala, 2007).

The cornerstones for lifelong language learning are laid in the basic education where the repertoire of objectives cover not only linguistic competences but also strategic competencies, both communication and learning strategies, and cultural skills as well. Furthermore, the overall aims of basic education are also to be reflected in foreign language education. These included, for instance, the goal of developing a healthy self-esteem and knowledge and skills needed for active involvement in the present and future democratic society.

Language education has a particular mission to support the linguistic and cultural identity of a pupil, as well as to foster his/her intercultural competences and strategic skills. Objectives and core contents of foreign languages are presented separately for grades 1-2, grades 3-6 and grades 7-9. The aims and core contents for grades 3-6 and 7-9 are more specific than for grades 1-2. The core curricula also stress the fundamental alignment between objectives, learning process and assessment.

Approaches and Methods in Finnish Language Classrooms

By tradition, the Finnish core curricula express norms concerning aims, focal content and guidelines of assessment (in terms of objects and reporting), but no straightforward rules are given on how to implement these regulations. The pedagogical freedom left to teachers is therefore exceptional compared to the situation in many other countries. Today, the fundamental aim is that children (or any language learner/user) from the very beginning of their lifelong FL learning path have motivation, skills and confidence in facing all new language experiences in school and out of school to develop their linguistic repertory. (For more specific points, see CEFR, 2001; 1-5, EVK, 2003, 19-25.)

If FL instruction is started in grades 1-2, instruction is to be functional and playful in nature, e.g. games, songs, nursery rhymes. The emphasis is (to be) on listening, understanding and speaking skills whereas writing is introduced gradually and used to support oral practice. The core contents are related to the pupil´s everyday lives, i.e. home and school. Also, pupils are introduced to the cultures and regions where the target language is used. (National Core Curriculum for Basic Education, 2004.)

Regarding pedagogical principles and practices, a number of approaches from various methodological origins merge in language classrooms. Communicative language teaching with modifications is the most common approach, mixed with traditional form-focused study of grammar. which is reinforced especially by the written matriculation examination at the end of upper secondary school. More recent focuses are learner autonomy, oral proficiency, study of culture and socio-culturally oriented learning environments supported by ICT.

The overall tendency of development during the recent years has shifted from studying the (structure of) language towards studying the use of languages for real life purposes. There has been a shift from written to oral language, from grammar

to language proficiency for real life needs, from translation to the communicative use of language, from teacher-centeredness to learner autonomy, from linguistic skills to intercultural communication competence and cultural sensitivity promoted by authentic intercultural encounters (*e.g*. Kohonen, Jaatinen, Kaikkonen & Lehtovaara, 2001; EVK, 2003; Takala, 2009; Kohonen, 2009).

Because of the freedom of choice concerning teaching and learning techniques, no standardized templates for language lessons are advisable. There are, however, a set of broadly agreed basic guidelines for structuring a language lesson that are introduced to student teachers as a preliminary blueprint to start their work in a language classroom. They are drawn on several sources: e.g. principles of activity theory (Engeström, 1982) and cognitive theories of language learning (Kristiansen, 1998) and encompass three major phases: 1. Orientation and motivation, 2. Internalisation of the content by rehearsal and elaboration, and 3. Application of linguistic content meaningful in in- and out-of-school settings.

In the first stage, linguistic content is usually introduced to the pupils by referring to e.g. the usefulness of the functions or vocabulary in real-life situations, pupils´ previous experiences of related situations to motivate the pupils to learn the intended structure or vocabulary.

In the following phase, pupils typically listen to the text or watch a video clip as an input. They are provided opportunities to seek for clarification from peers and the teacher to make sure that they understand what is being learnt. Pupils are instructed in pronunciation and intonation patterns, and generally asked to read aloud the text in pairs or individually. This done, the pupils discuss the content of the text guided by question prompts or pictorial cues like mind-maps. They help each other on the way and provide feedback to their peers. It tends to be the case that oral training is prioritized in the classroom, whereas written tasks are commonly assigned as homework. Even grammar is treated in the same way proceeding from oral practice to written production. Creative use of the content in focus is encouraged from the very beginning resulting in improvised pair discussions, small-scale dramas and ad hoc narratives based on the vocabulary presented in the textbook or other channel of linguistic input.

It is considered important to make a distinction between a task and an exercise in language teaching and learning. Tasks aim at using language for meaningful open-ended communication between people, they focus on the function and content of the message rather than on its form, and they provide opportunities for interaction, problem-solving and pedagogical intervention by the teacher and even enable scaffolding from peers. Exercises, on the other hand, rely heavily on a demand for formal accuracy and expected one-to-one responses. It goes without saying that tasks are the mode of work favoured in language teacher education and among leading language-teaching professionals. (Hildén, 2005)

The third main phase of the pedagogical process consists of putting the linguistic content into proper use in novel context relevant to the language-learning

pupil. The most instances of such "externalization" are homework assignments to write a story using the vocabulary or the grammatical item in focus or oral homework, for instance, recording a video-clip dealing with the thematic content of the previous classes. These items of work are presented in the next lesson to peers and the teacher, not exclusively in all-class but preferably in small groups to be commented on by peers.

Recalling the ultimate aim of language teaching and learning, the applied tasks can go far beyond the borders of home and school. At their best, they provide a link between school-based learning and intercultural experiences. Therefore, reports of chat conferences with foreign peers and field samples from real visits abroad or e.g. pupil exchanges are highly recommendable. The technical prerequisites to record and store oral and written records from students have existed in most Finnish homes for a long time. For some reason, language teachers have not felt too confident with incorporating the options offered by information and communication technologies into their teaching (Pöyhönen & Luukka, 2007). Instead of a homework booklet in paper format, an electronic portfolio could provide a format for long-term storing of samples for reflecting on one´s development over the years.

Assessment of Learning Outcomes

According to the Basic Education Act (Perusopetuslaki 628/1998), pupil assessment in basic comprehensive education primarily aims at guiding studying and, consequently, promoting learning and pupils´ self-assessment skills. The starting point for all assessment is the objectives of the curriculum that include subject specific progress, working and learning skills, and behaviour. It is important to note the distinction between the purposes of assessment which are the starting points for relevant assessment procedures and the arguments that can be presented concerning the validity of the assessment outcomes. In basic education curricula, two types of assessment are acknowledged: assessment during the course of studies, and assessment at the end of courses, schools years, and finally at the end of the entire basic education.

The modes of assessment and the quality requirements of assessment vary accordingly. For formative purposes during the course of education, criterion-referenced measures supported by on-going feedback and verbal records may be most appropriate, perhaps even as the only techniques applied in grades 1-7. From these grades onwards, pupils are given numerical grades, which however are not the only way of giving feedback on pupil progress. It is noteworthy that the grades are always assigned on the basis of the objectives in the curriculum, not by normative grounds of comparing pupils of a single class to each other. The grade must be based on varied sources of information; in a language subject this implies that both written and oral language performance should be considered. In addition, the grade in a foreign language includes the effort put into the studies as well as

related strategic and cultural skills. Tools for enhancing pupils´ self-assessment (*e.g.* the European Language Portfolio, ELP) offer an excellent, but yet rarely implemented option to widen the view on the multifaceted assessment of language proficiency.

Towards the end of the basic level of education, the demand for comparability of grades across the country becomes stronger, because the grades provide a selection ground for further studies at the secondary level. To ensure equity and national comparability, two junction points (at the end of the 6th grade and the 9th grade) are singled out and the criteria of a "good" performance (grade 8 on a 4-10 scale) are provided. These checkpoints are based on a Finnish application of the assessment scales included in the CEFR. Attainment of goals is compared to descriptions of the level of good performance separately for each area of language proficiency: listening comprehension, speaking, reading comprehension and writing. (See National Core Curriculum for Basic Education, 2004.)

The materials used for assessment can be designed by teachers themselves or even more common are tests that teachers are free to modify for their local needs (such as testing materials published by textbook writers in conjunction with their books, or tests produced yearly by teacher associations in their respective languages). In Finland, the pedagogical freedom of a language teacher broadly covers the choice of assessment tools. Only on the occasion of national assessment of learning outcomes, and for science, reading in L1 and mathematics under the OECD PISA-framework, are the sampled schools and teachers obliged to administrate an external test, written by a team of independent experts. The reports of these national assessment surveys are published by the National Board of Education and available on their website (Finnish National Board of Education).

Language Teacher Education

As mentioned earlier, the Finnish National Core Curriculum for Basic Education (2004) leaves a lot of pedagogical freedom to individual language teachers and teacher teams to apply and elaborate the national goals to local circumstances. They are, in fact, required to do so when writing the local school-related curricula drawing on the national core documents. Finnish language teachers are educated to cope with the task to translate the statements of the normative documents into everyday work to promote pupils´ learning. In the course of this work, the interaction of theory and practice introduced during the pre-service teacher education are revisited and supported by professional networks. A foreign language teacher's career from graduation to retirement spans an average of 40 years – so the in-service training and development projects are valuable to support the teachers to maintain and develop their professional competence and practices.

According to the Basic Education Decree (Perusopetusasetus 852/1998), children in grades 1-6 are taught primarily by class teachers and grades 7-9 by subject teachers. In spite of this, SUKOL, the national Federation of Foreign

Language Teachers in Finland, recommended already at the end of the 1990s that foreign languages should be taught by subject teachers in grades 1-6 as well. According to our understanding, the teachers with double qualification, class teacher qualification and subject teacher qualification demanded for teaching FL in grades 7-9, might in principle have the professional competence most suitable for teaching languages in primary education. With this kind of professional education, they both know how to teach young learners and have proficiency in foreign language (at least 60 ECTS of university studies in the language they teach).

In Finland, both the class teacher's and subject teacher's qualifications are based on a master's degree (300 ECTS). While class teachers are professionals in teaching young learners in general, they do not necessarily have enough knowledge and skills in any foreign language themselves and/or how to teach especially FL to young learners. On the other hand, subject teachers in foreign languages have proficiency in FL but not necessarily adequate education or experience in teaching young learners, meaning younger than teenagers.

In Finland, subject teachers in foreign languages are educated in seven universities, which geographically cover the country from the south to the north and from the west to the east. Some universities offer various minor studies of 25 ECTS to be included in the degree of subject teacher and class teacher students interested in early language education to offer knowledge and skills needed in the working life, *e.g.* CLIL (Juliet studies) in the University of Jyväskylä, Teaching Foreign Languages to Young Learners (TeFoLa studies) in the University of Eastern Finland, Joensuu, Multilingual and Intercultural Education (Flerspråkighetsdidaktik och interkulturell pedagogik) in Åbo Akademi University, Vaasa. Such study programmes provide good support for early language teaching and learning.

Co-operation concerning in-service training for language teachers is customarily established on the initiative of the Finnish National Board of Education, national teacher associations or, most recently, by international endeavours (projects and networks supported by the Council of Europe) or by nationally based research and development initiatives mentored by university staff. In-service training events arranged by the National Board of Education focus on current challenges of teachers´ daily work and are well attended especially at the onset of curricular reforms. Teacher associations arrange trips, seminars and summer courses for their members on diverse themes on demand. The role of European language policies and related networks has gained in importance since the Finnish membership in EU starting from 1995. Some of the language teachers have attended the European Center for Modern Languages (ECML) project dissemination seminars in Graz, Austria, and thereby acquired personal and professional links with their European colleagues. An ever-growing number of teachers and their pupils have made exchange visits to other European countries supported by programmes such as Erasmus or Nordplus.

In-service Support

Teacher Association

The Federation of Foreign Language Teachers in Finland, SUKOL, is a national level organization of associations of foreign language teachers, with 30 local and 8 national member associations. These in turn have a total of approximately 5500 members. It is a pedagogic organization, which aims to promote the instruction and study of foreign languages in Finland. SUKOL gives grants for teachers to participate in seminars and courses in order to support FL teachers' professional development. Also, it supports FL teachers' everyday work by producing and selling teaching materials and language tests. (SUKOL.)

SUKOL publishes the professional magazine Tempus 6–7 times annually disseminating the latest research findings concerning language teaching and learning as popularized articles suggesting ways language teachers might try out new ideas. In addition, Tempus invites foreign language teachers to write and share their tips for good practices of teaching and learning with each other.

SUKOL aims to connect language teachers but it wants to network as an association itself as well: it is a member of FIPLV, Fédération Internationale des Professeurs de Langues Vivantes, which in turn is a B-status member of UNESCO. Quite naturally, SUKOL has close relations with its Nordic counterparts, too. (See SUKOL.)

A Developmental Network Coordinated by the National Board of Education

One of the latest projects to develop the quality of language teaching in comprehensive schools is KIELITIVOLI (in English: Amusement park of languages) developing the foreign language education in basic education (Tuokko et al., 2011). The target group for the project is versatile, including the different stakeholders in the field of language teaching in comprehensive schools: educational providers, headmasters, language teachers, comprehensive school pupils and their parents. The project has two main aims: firstly, to diversify the selection of languages offered and studied in comprehensive schools and secondly, to develop the quality of language teaching. The project includes e.g. tailor-made in-service training for participating teachers (e.g. use of modern ICT and social media in language teaching), support and opportunities for networking between teachers, adding authentic connection to foreign languages and cultures.

In other words, KIELITIVOLI aims that also other languages than English would be started in primary schools (grades 1-6) and that studies would be continued after the primary school level as well, in upper classes 7-9 in comprehensive school and in the secondary level.

Research and Developmental Project Coordinated by Teacher Educators

At present, one prominent on-going research and developmental project is KIELO (2009-2012) launched and coordinated by the University of Helsinki, Research Centre for Foreign Language Education. It involves both researchers and language teachers. Teachers participating in this action research are expected to develop their teaching approach and practices as well as get support for their personal development and renewing their professionalism especially in the framework of CLT, communicative language teaching. (*e.g*. Harjanne & Tella, 2009.)

Topic Specific Pedagogical Network

The growing demands for foreign language proficiency and the restricted resources for the number of language studies in formal school education have encouraged different stakeholders such as the Finnish National Board of Education (National Core Curriculum for Basic Education 2004, pp. 270–273) and individual schools (CLIL Network) to find more time for language learning within the school context e.g. by CLIL, content and language integrated learning. The Network of Content and Language Integrated Learning in Finland was launched as part of education and development project in 2005-2007. The network supports practitioners in the field by offering theoretical and practical knowledge and information (CLIL Network).

Descriptions of the Best Practices: Cases ViKiPeda and OSKU

In the following we present two cases typical for current developmental work in the field of language teaching and learning. Both include the element of cooperation between different stakeholders in language education and the aim is to combine the theory and praxis.

During the last decade, cooperation between the national teacher education units in seven universities has been expanded and intensified e.g. in the form of different kinds of research-based projects. As a result of networking between the teacher educators, a tradition of ViKiPeda conferences (Conference in Foreign Language Education) was launched in 1999. ViKiPeda is a national conference organized every two years, by rotation, by one of the seven Universities, which offer subject teacher education in foreign languages (Jyväskylä, Tampere, Oulu, Turku, Helsinki, Joensuu and Vaasa). It offers a forum for sharing the latest research findings concerning language teaching and learning in different contexts of lifelong language learning. A major aim has been to invite not only teacher educators and researchers but also foreign language teachers from the field to participate and get familiar with the current research results to be utilized and applied in developing language teaching in practice and also to present their own experiments and experiences.

One of the central aims of ViKiPeda conferences from the very beginning has been mainly national but also increasingly international networking. This is the reason for inviting one or two guest speakers from abroad and writing articles in the conference proceedings either in English or German (conference proceedings published so far: Kaikkonen & Kohonen, 2000; Kohonen & Kaikkonen, 2002; Mäkinen, Kaikkonen & Kohonen, 2004; Koskensalo, Smeds, Kaikkonen & Kohonen, 2007; Tella, 2008, Kantelinen & Pollari, 2009). The second round of ViKiPeda conferences will start in the University of Jyväskylä in spring 2013.

OSKU (2006-2009) has been one of the most recent projects to support the research-based development work and networking between the different stakeholders in the field of foreign language education in Finnish comprehensive schools. The project work has involved researchers, teacher trainers, and FL teachers (Hildén, 2005; Hildén & Salo, 2011).

The rationale of the research and development project OSKU (abbreviated from the Finnish words for curriculum [OpetusSuunnitelma] and culture [KUlttuuri]) was targeted to serve multiple aims of networking and developing innovative ways of implementing the National Core Curriculum for Basic Education (2004) in the everyday life of comprehensive schools. Irrespective of the centralized design of the core curriculum, Finnish teachers have great pedagogical freedom to choose their methods and approaches, and the best practices must be trialled and elaborated by language teaching experts themselves in mutual dialogue with language students. Communicative tasks with various focuses were adopted as the main tool for bridging the theoretical principles of written curricula with the learning experiences of students and teachers. As mentioned earlier, the core curricula also define basic educational values and the nature of knowledge. The conceptions of learning and teaching deduced from these put strong emphasis e.g. on collaborative knowledge construction and student ´s ownership of learning and gradual growth of self-regulation. These objectives are readily served by the rationale of the European Language Portfolio (ELP) recommended and adopted for use by many of the participating professionals. The experiences and research findings from OSKU participants were published on a webpage and a book edited by Hildén and Salo (2011).

CHALLENGES OF FUTURE QUALITY WORK TO DEVELOP THE FOREIGN LANGUAGE TEACHING AND LEARNING IN FINNISH BASIC EDUCATION

A lot of determined quality work in the field of language teaching and learning has been done in Finland and the progress described above deserve to be maintained. Still, a number of challenges need to be considered.

A persistent problem, pointed out frequently over the years, hampering Finnish language education is the lack of overall planning at the national level (*e.g.*,

Pyykkö, 2009). Another of the biggest challenges is the fact that the curricula of different education levels and different languages do not form a continuum (Pyykkö, 2009, p. 49). Thirdly, and partly following from the challenges mentioned, the diversity of language studies is too narrow, having a too heavy concentration on English, in spite of the clear need of e.g. Swedish, Russian, German and Spanish. Along with this pursuit the mastery of national languages should be ensured in an officially bilingual country. An early start would be beneficial to especially those languages that pupils are not exposed to in their daily lives through the media. (*e.g.* Mård-Miettinen & Björklund, 2007; Sajavaara, Luukka & Pöyhönen, 2007.)

Diversity of language studies should be catered for and supported by means of high quality curricular planning to avoid unnecessary overlaps and gaps in content and scheduling. Not all content areas need to be studied in all languages. School curricula should acknowledge the principles of plurilingualism and allow for more diverse profiles of language skills as goals of study. Instead of a more or less even target profiles across syllabi, e.g. predominantly receptive skills might suffice in some languages, while productive proficiency might be strived for in others. The role of communicative oral language use in school context could easily be enhanced by increasing tasks that enable cultural encounters and accordingly add to the authenticity of school studies. Combining in -school and out- of -school activities in foreign language learning and teaching, out-of-school activities should be paid attention to and utilized in school studies. Language learning could be integrated into other subject contents and supported by cooperation between teachers in different subjects.

Teachers, language teachers included, often experience feelings of insufficiency in their work, largely because of extensive content standards set by the core curriculum. A less fully packed content of language courses might improve the professional wellbeing of teachers as well as promote in-depth learning and personal growth of learners.

One concrete means to respond to many of the current challenges is the use of ELP in the comprehensive school. At the moment, there is a development project group working funded by the National Board of Education to prepare two versions of ELP to be used in basic education. The Finnish ELP versions are prepared as a collaboration among researchers, teacher educators and language teachers. The implementation of ELP requires new thinking and a certain amount of in-service training should accompany true commitment to this mode of work. Many of the current challenges in regard to pupil autonomy (including self-assessment and responsibility issues) and overall identity development could be better addressed.

The language teaching profession and the subsequent language learning activity at schools are still seen as a rather lonely and teacher-led endeavour in a closed classroom environment. Networking in different directions and with many kinds of stakeholders should be encouraged and supported. (Luukka *et al*., 2008, p. 153).

A more open way of thinking can be nurtured by active, research-based networks for developing language education as cooperation between researchers, teacher educators, teachers and teacher students at the national as well as the international level.

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12. RELIGIOUS EDUCATION

in Finnish School System

ABSTRACT

The Finnish solution for RE in public education is a unique model if we compare it to the solutions used in other European countries. In Finland RE is given according to the pupils' own religions. The Finnish model of RE implies the idea of democratic, civil society, where different faiths, beliefs and worldviews can co-exist. The curriculum of RE in Finland emphasises religious literacy and religious competence. Furthermore, elements of cultural heritage and identity are also present in the curriculum. The pupils need skills for inter-religious dialogue and also skills for living in a multi-religious society. The Finnish approach to RE emphasises tolerance towards others. The subject teachers of RE have very good education; they have a master's degree from a university and they are also qualified to teach some other school subject, usually psychology. Although RE is not a PISA-subject and it has a role in comprehensive education in supporting the formulation of pupils' attitudes and worldviews in Finnish schools.
Keywords: Religious education, identity, RE subject teacher education, curriculum

BACKGROUND

This article focuses on religious education (hence RE) in Finnish basic education. Religious education has in recent years been the focus of international research and political debate. Most European societies provide some kind of RE in their school curricula. Internationally, there has been much active discussion about what is the function and the most suitable solution for RE in public schools in multicultural, post-modern societies, and whether RE could be made more uniform in European Union states in order to handle and teach religions contextually as a part of the cultural and religious diversity of Europe (see Everington, 2007). In addition, recently scholars have debated about how RE can be linked to topics such as value education in schools and to education concerning human rights, other democratic ideals, citizenship and multiculturalism.

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 177–187.
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The Europeanization of RE is a fairly recent trend as traditionally RE in different societies and the accepted concepts of nationality, citizens' rights, the integration of minorities in society, and furthermore questions of multiculturalism have been seen to be intertwined (Skeie, 2001, p. 237, Plesner, 2002, p. 111, Hull, 2002, pp. 123–125, Willaime, 2007, pp. 62–65.) However, in many European societies there have been shared concerns about what will happen to the present generation of minority youth. Religious education has been viewed as one way to integrate minorities into society. It is has been argued that RE gives young people skills for living with, and an ability to respect the dialogue and tolerance associated with adjusting diverse lifestyles and customs into the receiving cultures and societies (Williaime, 2007, p. 63, Sakaranaho, 2007, pp. 7–8.). Furthermore, it has been maintained that RE can provide important support for pupils' identity formation processes. It gives pupils tools to understand their own identities as human beings and opens pathways for living and acting in a multicultural world. (Niemi, 2005, pp. 42–43.)

This article will begin with describing the background of the Finnish religious education solution and by examining it within a broader European and Nordic context. Then the article will proceed to more practical matters. The article will then focus on religious education teachers. It will then describe the role of religious education in Finnish school education. Finally, the article will close with some current issues and development challenges for religious education in Finland

THE FINNISH SOLUTION FOR RELIGIOUS EDUCATION IN PUBLIC SCHOOLS

The Finnish solution for RE is a unique way of organising RE in public schools. Finland has a very strong public school tradition and there are only a few private schools in the country. There are only a few religious based private schools in Finland and the role of churches and religious communities is very limited in public education. The education system in Finland differs from many other societies where the role of religious communities is very central to basic education. Nowadays, there are less than twenty religious schools in Finland, and their role in comprehensive education is very marginal, despite the fact that in the 1990's some Evangelical Protestant schools were founded in Finland. The Finnish school system is thus essentially non-religious (Kallioniemi, 2008).

In Finland the teaching of religion is generally seen as a function of society. Over time there have been debates about the function and contents of RE in public schools. In some periods of Finnish school history it had been suggested that RE should be replaced by some other subject e.g. common ethics, but after discussions by Finnish school policy makers and in the Finnish Parliament it has been accepted that there should be compulsory RE lessons in public schools. At the background of this decision is the religion sociological situation of Finnish society: the majority of people are members of the Lutheran Church and the society has been very

homogenous in religious matters. The largest religious minority in Finnish history has been the Greek Orthodox Church, but its status in Finnish society is very similar to the Lutheran Church, which has been akin to a state church since the Reformation. The historical roots of the current solution for RE are in the 1920's. It was then deemed that RE in grammar schools should be taught according to the religion to which members the majority of the pupils in the schools belonged. No big changes to the organization model of RE have been made since and the basic structure for the organization of RE has remained unaltered (Kallioniemi, 2004, pp. 146–148).

The Finnish solution of religious education can be characterized from an international perspective as a religion-based model to organize religious education in society owned schools (Schreiner, 2001, p. 263). However, in Finland religious education has different aims and functions other than catechetical confessional education. Skeie (2001, p. 243) has formulated a framework for comparing religious education in Europe. According him, solutions for religious education in Europe can been divided into two different types: a. the uniform, strong solution and b. the multiform, weak solution. In the uniform strong solution there is an emphasis on society's willingness to adopt one model for religious education, which can be confessional or non-confessional religious education. The other model can be labelled the multiform weak solution, this is emphasised in societies less willing to adopt a uniform solution for religious education. Finland's solution belongs to the multiform, weak solution group. Actually, the Finnish solution belongs to a sub-category of the secular system as there are different kinds of religious education operating side-by-side in schools. (Skeie, 2001, p. 241–243)

From the European perspective the Finnish solution is unique, as religious minorities participate in RE according to their own religion in state-owned schools. The Finnish model differs from the models in other Nordic countries, too. For instance, in Sweden, the renewal of RE took place in 1962 and the subject is non-denominational in its character (Larsson, 1996, pp. 70–71.) The same kind of solution was accepted in Norway in 1997 (Haakedal, 2000, PP. 88–97). In Europe, only the Austrian model is similar to the Finnish solution. However, in Austria the religious communities are responsible for the RE syllabus and they also authorise the textbooks for RE (Pollitt, 2007, p. 19; Schreiner, 2001, p. 97). In Finland the religious education syllabus are made as a co-operation between the National Board of Education and religious communities – but the instruction is controlled and enforced by the state. This is a very unique way to organise religious education in a state school system (Davie, 2000, pp. 90–91; Kodela & Bassler, 2004).

At the beginning of 2000 changes in RE occurred again on legislation grounds. The Finnish Parliament renewed the Act of Freedom from Religion in 2003. After amending the Freedom from Religion Law, the Law for Comprehensive School (454/2003) was also amended. According to the Law, pupils have a right to religious education in school, if some regulations are fulfilled (*e.g*. the Board of Education has accepted the curriculum for that specific form of religious education

and there are three pupils whose parents have asked for it). At the background of the renewed law there was the idea of positive freedom from religion. The state was to ensure the right to freedom of religion and also ensure that individuals have possibilities to practice their religions. The law also formulated the right to RE in the more positive than negative spirit of freedom from religion. This involved changes to RE in schools. While "confessional RE" changed to "RE according to one's own religion", pupils who did not belong to religious communities could no longer ask for exemption from RE. The law has been framed to put all religions on the same footing and tries to promote religious equality (Seppo, 2003, pp. 177–179). In Finland there is a specific subject called "life question and ethics" (secular ethics) for those pupils who do not belong to any religious communities. Life questions and ethics is based mainly on philosophy. Despite its name, the contents of life question and ethics also includes religious studies and cultural anthropology. Although the number of these inhabitants who belong to some religious community has been decreasing over the years, approximately 90 % of Finnish pupils participate in RE lessons in comprehensive school.

After the new legislation the Board of Education begun to prepare the new curricula of RE in autumn 2004 and the work was finished in 2006. In addition to Lutheran and Orthodox RE curricula, 11 different curricula at the comprehensive level were written and accepted (Framework for Comprehensive Curriculum for Other Religions 2006). The framework for minority RE has been produced in co-operation with the religious groups and the Board of Education. This curriculum set out the common aims for all models of RE. It also stated the aims for Lutheran and Greek Orthodox RE. The general aims for all the religion-based groups' curricula are to look at the religious and ethical dimension of life from the viewpoint of the pupils' own development and also as a broader phenomenon in society. The aim of RE is to produce all-round literacy. According to the general aims of RE the task of this education is to make the pupils familiar with their own religions, to be familiar with the Finnish religious traditions, to be familiar with other religions to help the pupils understand the cultural and human meaning of religion, to introduce the pupils to ethical responsible and to help them understand the ethical dimension of religion (National Core Curriculum for Basic Education 2004).

Today the variety of religions has increased in schools to the extent that it is possible that some schools provide religious education lessons in at least six or seven different forms, e.g. Lutheran, Orthodox, Islam, Catholic, Adventist RE and also Life Questions and Ethics (Kallioniemi & Siitonen, 2003, p. 53.). As the Finnish solution of RE is based on individuals membership in state recognized religious communities, the schools not only give instruction in different religions but also teach different forms of the same religion, e.g. Lutheran, Orthodox and Catholic Christianity. Although all different forms of RE have the same general aims, their interpretations vary significantly in their curricula. In principle minority religious groups' curricula are in line with these general aims, but most of them

differ from these nationally accepted aims in their emphasis. For instance, Orthodox and Catholic RE are based clearly on the dominations' own religious traditions and attempt to support the pupils' Catholic or Orthodox identities (Kallioniemi, 2008).

THE NATURE AND ROLE OF RE IN BASIC EDUCATION

Religious Education is a subject taught in basic education. The subject can be approached from two viewpoints: the characteristic of the subject itself and its school legislation status. These two viewpoints overlap so that in both instances religious education is related to other school subjects and school education in general. However, the characteristics of the subject are more important than the legislative aspect in this discussion. Some of the subject specific issues were covered in the discussion concerning changes in the 2000's. Concerning those differences, it can be noted that the legislative status of RE is in principle similar to other subjects: it is a state-given, compulsory and every teacher should teach is as a part of her or his duty. The total number of RE lessons given has been reduced significantly in recent decades. Religious Education is a very popular school subject for the youngest pupils, but its popularity decreases in the higher classes. Usually in the lower and higher levels of comprehensive school there is one RE lesson a week. One of the general aims for all the religion-based groups' curricula is to look at the religious and ethical dimension of life from the viewpoint of the pupils' own development and also as a broader phenomenon in society. The aim of RE is to produce all round literacy. According to the general aims of RE, the task of education is to be familiar with one's own religion, to be familiar with the Finnish religious traditions, to be familiar with other religions to help the pupils understand the cultural and human meaning of religion, to instruct the pupils about ethical responsible and to help them understand the ethical dimension of religion (National Core Curriculum for Basic Education 2004).

The contents of RE are diverse: there have been contents concerning church history, church annual festivals and bible stories. The main idea of RE has been very contextual: first it looked at children's proximate environments. Then the questions have been broadened to other areas. In recent decades the shift has moved toward religious studies. The teaching of ethics and life questions have been a vital part of RE in Finland. If we take an overview of RE curricula, we can see that half of the content in the subject is life questions and ethics and 30% deals with familiarization of the children with their own religions and habits and the last 20% includes other religions and the Finnish religious landscape. Usually life question and ethics approaches RE in a very child-centred way, i.e., the basic aim of the contents is to strengthen children's and young people's familiarization with themselves and also to help them maintain a positive self-portrait. The main topics deal with the children's own religion and religious habits at home and in society: e.g. how families in Finland celebrate Christmas and Easter and the church

festivals in a typical life cycle, e.g., confirmation, marriage and funerals. Learning about other faiths and religions begins in the familiar environment: in the lower classes investigations are made about which religions are located in the children's environments and the habits and rituals of followers of these other religions. Gradually there is a shift towards broader questions such as: inter-religious dialogue, human rights, religious freedom and religions in politics. (NCCBE 2004)

There are a variety of textbooks for RE. Usually pupils in each school get their own new RE textbook every year. The textbooks are produced by commercial publishers and they are usually written as a co-operation between RE specialists and teachers. Usually the textbooks are of a very high-level, as they are kept up-to-date. Nowadays there are also a lot of suitable teaching materials for teachers and working materials for pupils also on the Internet.

When RE is compared to other basic education subjects there are certain specific characteristics in religious education beyond the obvious differences in substance (NCCBE 2004). These characteristics can be grouped under four descriptive qualities: integrative practice, intimate interaction, critical thinking and holistic knowledge.

Integrative Practice

First, religious education is an integrative subject. Although the classical contents of RE: church history, bible stories and religious festivals and ceremonies have been a central part of RE curricula, they are teaching from a very integrative approach. The integration characterizes both its practice and aims. In the pedagogical practice the content in religious education covers for instance History, Arts, Music and Literature. Furthermore, human rights education, citizenship education and environmental education have been a vital part of RE curricula.

Likewise, the instruction is methodically diverse as it uses methods from different subjects and related fields. On the other hand, the aims of the subjects include an integrative approach underlying the instruction, namely, supporting the formation of a personal worldview and emphasising pupils' life-questions. The formation of a personal worldview and the examination of pupils' life-questions have been leading aspects in the aims and contents of RE since the 1970's when comprehensive schools were first introduced in Finland. A lot of different kinds of pupil auto bibliographic materials are used in basic teaching. For example, in the lower classes the pupils reflect on their self-images by drawing different kinds of self-images and in the higher classes pupils have to answer different kinds of questionnaires concerning their own self-reflections. Different kinds of actual life questions of pupils are a very central part of RE curricula. (NCCBE 2004).

Intimate Interaction

Second, religious education is increasingly becoming an intimate subject. As the amount in religious education given has increased, the number of pupils in instruction groups has decreased. In addition to the strong tradition of Biblical story telling in the lower grades, in the 2000's methods that include elements of contemplation, quiet, peace and wondering about nature have increased. This approach, which focuses on children's spirituality, is nowadays very strong in RE in the lower classes (Kallioniemi, 2007).

The current classroom culture emphasis on sharing and wonder in religious education contrasts with everyday haste and to some extent traditional frontal instruction (see ibid.). The pedagogy of RE in Finland has in recent years developed towards a more co-operational direction: very typical teaching methods in lower classes are story-telling, group tasks and methods which focus on creativity.

Critical Thinking

Third, religious education in Finland emphasises critical thinking. While the denominational elements are still included in the instruction, the emphasis is increasingly on open-endedness and integrity of personal convictions. Dialogical methods are used for supporting the development of personal argumentation and views on life, ethics and other issues concerning religion.

Since the 1980's, the denominational elements have increasingly become a source for reflection on personal meaning rather than something adopted as such (Kallioniemi & Ubani, 2008). The emphasis of meaningfulness has been very strong in RE. At the background of this approach is existential philosophy and humanistic psychology (Niemi, 1991, pp. 37–38; Niemi, 2005).

Holistic Knowledge

When compared to other theoretical subjects with content aims, religious education is relatively inclusive as it has different ways of being aware of and conceptualising phenomena in life. At the background of this, is an emphasis on the holistic development of the pupil. This is actualised in the approach towards subject specific contents such as belief, conviction and faith or emotions. As phenomena they are not necessarily sufficiently reducible cognitive conceptualisations. While conceptualisations are used for understanding such phenomena, the formulations are not used to normatively explain them.

RE TEACHERS IN FINLAND

The first question when discussing RE in school education is who teaches RE? In Finland the teacher qualifications for RE in public schools are completely academic. In other words, religion professionals are not qualified to teach RE without proper teacher education. Religious education is usually provided by primary teachers (grades 1-6), in the lower basic education grades. In the lower secondary level (grades 7 and above) subject teachers are responsible for teaching RE.

In Finland, religious education teacher education is a function of universities. The vast majority of RE subject teachers in Finland are theologians, but in recent years there have been more and more RE teachers who have taken religious studies. Most RE teachers have specialised in some other school subjects, e.g. psychology or history. They have to pass the content studies courses in their subject faculty and studies in pedagogy at departments of teacher education. New forms of RE subject teacher education have been developed in recent years. The leading idea is to develop this education in a research-based direction. The teacher as an action researcher is one leading idea of RE teacher education. As the studies in subject pedagogy in RE are mainly based on the educational research, student RE teachers also have to pass a course in research methods in education. All religious education teachers have to take part in a seminar as part of their studies in the teacher education programme. This seminar work is like a minor master's thesis in education. Students choose a research topic; usually they collect some research data, analyse the data and then write a report. The topics vary: in the last decades the most popular research topics have been concerned with how learning occurs in RE. There are also increasing numbers of research projects in RE teacher education (Kallioniemi, 1997; Hella, 2007; Ubani, 2011).

The subject RE teachers' professional identity has been shifting from the theological profession toward more pedagogical professionalism especially since the 1970's. Schools have emphasised the RE teachers' status and function in schools as representatives of their own area of expertise. The RE teachers have also clearly emphasised their own professional identity and wanted to see themselves as part of the school staff rather than being representatives of a religion or religious traditions in schools. (Kallioniemi, 1997, p. 153) In an international study, Finnish RE teachers' pedagogical orientation has been compared to teachers in 15 other European countries. The study described the Finnish RE teachers' professional orientation as modern traditionalist. On the other hand they appreciate and have adapted themselves to the multicultural and pluralist trends in Finnish society. Almost all (99.6 percent) of the Finnish teachers that took part in the study, agreed that the most important goal of RE is teaching about religions. However, two-thirds (62.7 percent) of the very same teachers agreed also on the importance of teaching religion. Finnish RE teachers also seemed to be versatile in their use of teaching methods (Räsänen & Ubani, 2009; Ubani, 2011).

Primary teachers pass a specific course for teaching RE in their basic education. The courses are not the same in different universities, but usually there are lectures and group in which the student primary teachers are taught to understand the function of RE as a part of the school curriculum. Furthermore, they are also given a readiness to understand the meaning of religion in the life of human beings, humankind and societies. They also are given a readiness to plan RE curricula and to apply different kinds of methods in teaching RE. Some 10% of student primary teachers continue their studies to specialise more in RE. They do this by studying in a faculty of theology, which provides specific courses for them. Some students also do their master's thesis in the field of RE. Student primary school teachers think that RE is an important subject for pupils and society, but they have problems in teaching it in actual school situations. Many student primary teachers have pointed out that their motivation for teaching RE is low and they have problems with the content knowledge of RE (Kallioniemi & Ubani, 2010, p. 260-261).

Currently, the key challenge in RE teacher education is minority RE teachers' qualifications. Teacher education for these groups teachers begun in 2007 at the University of Helsinki with financial aid from the Ministry of Education, but there are many problems that have not yet solved. For example, in Finland all teachers' education is at university level. In many minority groups there are candidates who do not speak Finnish very well. When a teacher teaches at the comprehensive level she or he should be able to speak Finnish fluently. In addition there have not been many candidates who have the required basic education. Many candidates, who *e.g.*, want to teach Islamic RE in Finnish schools, have not completed basic Finnish education. In Finland we have had no chairs for Islamic Studies either. However, the Department of Religious Studies has now developed a specific education programme for content knowledge in Islamic and Buddhism Studies.

DISCUSSION

The latest discussions in Finland concerning religious education in state schools have brought up the need for a common curriculum for religious education and ethics in schools. In basic education two options of how the current solution can progress have been outlined. First, a proposal for one common religious education subject for all students has been made. Another option has been to continue the present solution with the inclusion of shared instruction in upper grades for all students such as ethics instruction that would be based on class dialogue. Since the early 2000's discussions on the legitimacy of religious education in Finnish school education have decreased. As Finnish state education has included religious education since its beginning, any changes in the subject or its extinction would lead to the need to re-evaluate and re-analyse all Finnish comprehensive education and its constitution from a holistic viewpoint. Furthermore, while religious education is not directly measured in PISA, it can be argued that the subject contributes to balancing the Finnish curriculum in an integrative manner.

Although there has been much debate about the model of RE in comprehensive schools, the majority of Finnish citizens, headmasters and teachers are of the opinion that teaching RE is very important to comprehensive education. The significance of RE has in recent years became more obvious in Finnish society, because changes towards a multicultural society have been so prominent. The Finnish model for RE is a very unique one; it takes parental rights as the focus of education. Everybody gets RE according to his or her own religion. Although the background of RE is according to one's own religion, the subject can give many possibilities to educate children to understand the vast diversity of different religions. In addition, it may also give opportunities to participate in religious dialogue in everyday life. Furthermore, while it aims to promote critical understanding and ethical thinking, it strives to give a basic competence for living as a citizen in a post-modern multi-religious society.

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13. HISTORY, SOCIAL SCIENCE AND GEOGRAPHY EDUCATION

in Finnish Schools and Teacher Education

ABSTRACT

The article highlights the main characteristics of the humanities, or school subjects having a humanistic orientation, from the point of view of geography, history and social science in comprehensive schools. The educational objectives for these three subjects in the present National Core Curriculum for Basic Education are focused on the development of students' thinking skills and understanding of the nature of historical, societal or geographical knowledge, and skills of using, for example, historical sources. This emphasis on learning, thinking and skills implies that activating teaching methods are used in lessons, and the assessment of learning outcomes is expected to follow the skills-based strand of humanities education. Future challenges are also in focus, for example intercultural education, which is becoming more and more crucial to history, social science and geography.
Keywords: assessment, cross-disciplinary themes, geography, history, social science, subject didactics

INTRODUCTION

The composition of school curricula and the status and traditions of specific school subjects can be very different between countries. This is obvious in the case of the humanities, where subject constructions can be numerous. In Finland, the humanities as such are not an established entity, and the list of school subjects that basically could belong to this family having a humanistic orientation, includes a number of independent subjects in compulsory schools such as: history, social science, religion, and geography. Unlike for instance the subject cluster social studies in American schools, history and social science are independent subjects, and geography also as an independent subject, is counted in the science subjects and is taught by the same teachers who teach biology. In the Finnish

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 189–207.
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educational system, and in the present article, social science refers to the subject including elements of civic education, economy, sociology and law.

In our article the focus is on the geography, history and social science, on their aims and contents in the present National Core Curriculum for Basic Education (for comprehensive schools) and on their main features as school subjects. Moreover, we will also describe the education of teachers for these subjects. What is common to these three subjects is that each of them describes and examines human beings and their activities in their regional, social and cultural environments. The National Core Curriculum for Basic Education (2003) as well as the one for Upper Secondary Schools (2004) emphasize basically similar values such as human rights, equality, democracy, respect for the diversity of nature and sustainable development and acceptance of cultural diversity, all of which are significant in the teaching of the humanities, both for their subject-specific aims and contents. These subjects are, however, rather different from each other from the point of view of their aims, contents and nature of knowledge.

For decades, history and social science had formed a kind of subject coalition (history and social science) and had a common curriculum although the contents of each subject were kept apart. In the 2004 curricular reform, they were finally separated into two subjects, in which students' achievements are assessed independently. However, both subjects are still usually taught by history teachers who took social sciences as a minor subject in their degrees. A major reason for the separation was the different nature of these subjects, both relying on fundamentally different academic disciplines. The decision to separate history and social sciences into two independent subjects can be seen as an attempt to improve the status of social science education, as the politicians have been worried about young people's political disinterest and disengagement, and thus they were willing to encourage citizenship education.

As for geography, this article will predominately look at cultural geography (one of the branches of geography), but the point of view of physical geography can't be ignored in the Finnish school system, because it is an important part of the geography curriculum in schools. In Finland geography has long been taught as an independent subject. In the first school years geography is connected to biology and other natural sciences like chemistry, physics and health education, forming a subject group called environment and nature studies. From the point of view of humanistic geography it is noticeable that the social environment was not included in the first school years' textbooks until after the 2004 curricular reform. The reason why geography has been connected to the natural sciences but not to the humanities or social studies in Finland is because the roots of geography lie in physical geography (see the article by Lavonen & Juuti in this book). There is a strong possibility that its connection to natural sciences, even at universities, gives geography a stronger stature as a school subject than is the case in some other European countries where geography is connected to the humanities. Also in Finland a knowledge of cultural geography, especially human geography has

become more essential nowadays, and because of this there are several geographical themes, which are closely connected to the humanities or social studies in Finnish school education such as the diversity of human life, cultural identity and global citizenship. These are the reasons, why geography is reviewed among the subject group of the humanities in this book.

HISTORY, SOCIAL SCIENCE AND GEOGRAPHY IN THE NATIONAL CORE CURRICULUM OF FINNISH COMPREHENSIVE SCHOOLS

The humanities are quite small school subjects, compared for instance with mathematics, first language and foreign languages, especially in the lower grades of comprehensive school. The amount of teaching time allocated to these subjects is shown in Table 1.

Table 1. Allocation of humanities subjects in the grades (lesson hours or 45 min/week/year) in comprehensive school.

Grade	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Students' age	7	8	9	10	11	12	13	14	15
Level (unofficial)	primary level						lower secondary level		
The humanities									
History	-	-	-	-	1+2 (or 2+1) = 3 (Minimum 3 lesson hours/week for Grades 5 and 6 altogether; e.g. 1 hour for Grade 5 and 2 for Grade 6)		2	2	-
Social science	-	-	-	-	-	-	-	-	3
Geography	Integrated environment and nature studies 2.25 lesson hours/week/year				Integrated geography an biology 3 lesson hours/week/year		Geography 1.2 lesson hours/week/year		

History teaching does not begin in comprehensive school until grade 5, when the pupils are 11 years old, although some themes may have occasionally occurred within some other subjects, such as mother tongue or religious education. The present history syllabus for basic education (2004) is divided into two parts: history for grades 5 to 6 (ages 11 to 12), and for grades 7 through to 9 (ages 13 to 15). For the two lower grade years, the minimum number of lessons is 3 per week, which makes up the total. In the three higher grades of the comprehensive school, history is normally taught in grades 7 and 8 (2 hours per week) and social studies in grade 9 (3 hours per week). The syllabus is structured chronologically, from prehistoric times to the present. There is also a very clear focus on the skills component and on the formal requirements of learning history. History teaching in grades 5 to 6

aims at familiarizing children with their own roots and the nature and acquisition of historical knowledge and its central concepts such as time and change. Especially in the earlier grades the pupils should get opportunities to experience historical empathy and the goals are related to the nature of history and historical thinking. The historical substance consists of some central events and phenomena from prehistory up to the French Revolution, and in the history of Finland, from prehistory to the end of Swedish regime in Finland in the early 19th century. The syllabus of grades 7–9 aims at deepening the pupils' understanding of historical knowledge. The pupils should learn to find and use historical information and various sources, be able to formulate an opinion, understand interpretations, explain human activity and also estimate future alternatives on the basis of their knowledge of historical changes. In general, grades 7 and 8 deal with 19th and 20th century history, respectively. A typical feature of the Finnish history syllabus is an emphasis on modern history and on the newest history in particular. In the syllabus of grade 8, this implies a strong focus on the political turmoil of the 20th century, in which the key events of Finnish history (achievement of independence, the Civil War, the Second World War) get a prominent role. It has to be emphasized that the history of Finland is dovetailed with European and world history. Teaching contents are not limited to the history of Finland.

Social science can be seen as a key subject in citizenship education, the channel for dealing systematically with the contents of citizenship education. It is also the subject that aims to give students the necessary knowledge base and tools for participating in society. However, its status in the Finnish school system is not very strong because it is only taught in the final year of comprehensive school. The key themes in the curriculum are individuals as members of a community, the welfare of the individual, exerting influence and decision-making (political system, administration, media), security of the citizen, managing one's own finances, economics and economic policy. The number of lessons per week is three in the present curriculum. It was given one more lesson per week in the latest curricular reform.

Geography is taught through basic education (Table 1) from grades 1 to 9 (age 7-15) and also in the optional upper secondary school (age 16-18). It was introduced for the pupils of grades 1-4 as a part of environment and nature studies (National Core Curricula for Basic Education 2004). This means that geography is integrated with the subjects of biology, physics, chemistry and health education in grades -4, while in grades 5-6 it is integrated with biology and is taught by class teachers. In grades 1-6 geography teaching is the responsibility of class teachers, and subject teachers take responsibility in grades 7-9. An important aim of geography is that the pupils in grades 1-4 should adopt a positive relation with nature and the environment and they also learn to understand the importance of interaction between the individual and the environment. The core content concerns the home region and the world of the human living environment. In grades 5-6 the various regions of the world come under examination. Also what is involved in

being a Finnish citizen and part of European culture starts to develop. Geography lessons give the pupils the opportunity to understand phenomena associated with the activity of human beings and the natural world. The studied geographical areas expand from Finland to Europe and to the rest of the world; in regional geography the focus has been systemic. In grades 7-9, a more detailed description of natural, built and social environments is introduced both at the local and global levels. Thus geography is a humanistic oriented science school subject, which connects knowledge from several other disciplines.

The distribution of lesson hours determined by the Government specifies the minimum number of the contact hours in geography just like in all subjects. A minimum of 0.75 lesson hours per week of geography is taught in the 5th to 6th grades in Finland (Cantell *et al*., 2007), if geography and biology are taught to the same extent, as they are in most of the schools.

ON THE ESSENTIAL NATURE OF SPECIFIC SUBJECTS

History and History Education

The challenges, goals and expectations for school history are versatile and they change over time. Finding a balance between questions dealing with how and what or contents and skills, has been topical for a few decades in Finnish history education. A related distinction is the triangle between values, facts and skills. These are, of course, not dichotomous distinctions, and contents and skills are intertwined. Nevertheless, the approaches to teaching history can be categorized on the basis of their emphasis, and they are basically reflecting 'different orientations toward historical pedagogy and epistemology' (Seixas, 2000). The classical way of teaching history was focused on values, transmitting in the Finnish case, nationalistic values and supporting the master narrative of a nation fighting for its independence. This ethos was especially strong in the earlier half of the 20th century. It was followed by an objectivistic trend, pursuing a very neutral transmission of facts and contents, trying to be pure in values and attitudes. The objectivistic mode of teaching has been very strong (Castrén, 1992; Arola, 2002). It is a cognitively and pedagogically easy orientation, and it can be a safe solution, if teachers want to avoid dealing with conflicting information or controversial and sensitive issues and only mediate facts. However, at least according to school curricula and pedagogical literature, the common trend of history teaching in Western societies, including Finland, is nowadays to emphasize students' thinking skills, and skills of acquiring knowledge, as well as understanding the multiple perspectives of history (van der Leeuw-Roord, 2003). This is very obvious in the present Finnish history curriculum for Basic Education, where there is a clear emphasis on constructivist and socio-cultural notions of learning. History in principle can also be seen through critical eyeglasses, as conflicting stories and multiple truths, multiple windows to the same historical events. Consequently

today, there is a strong focus on the multiperspective approach to teaching history, seeing it as a discourse of various interpretations (Stradling, 2003). However, we have very little evidence about the actual processes of history teaching in the classrooms. The principles of multiperspectivity are not perhaps fulfilled very often, but for instance training students to examine historical sources and making conclusions based on evidence has certainly become a fairly common method.

The National Core Curricula for Basic Education underlines the nature of the academic domain as the foundation of the school subject; it aims at fostering critical thinking skills, and to acknowledge the multiperspectivity of history, and the concepts of time, causation, change and continuity. A key concept in the present history curricula is historical consciousness, which involves seeing the continuum between past, present and future. History is also seen as related to citizenship education, supporting the construction of students' identities and their development into active citizens.

Social Studies and Social Science Education

Social science can be characterized as a cross-disciplinary school subject. It is characterised by a diversity of background sciences, and its content is based on the different branches of social sciences – political science, economy, social policy, sociology and law (Elio, 1993; Löfström, 2001). The role of these sciences should not be seen only as related to actual contents, but perhaps more as a way of thinking and understanding basic concepts. As Löfström, Virta and van den Berg (2010) remark, it may be difficult to fully pay attention to the nature of school social sciences because the subject is based on various branches of the social sciences. The actual content drawn from social sciences is, however, rather thin particularly in the comprehensive school curriculum.

Instead, the social science curriculum contains a lot of descriptive instruction about organizations, institutions and structures in society (for instance parliament, the government, voting, saving, and municipal services). In the practice of teaching, attention is also given to society at the micro-level, and on how adolescents for instance encounter social decision-making and economical issues in their everyday life. An important side of this school subject is socialization: one of the main goals of the social science education is to educate students to citizenship, to foster their skills in active participation in society, and furthermore to train them to use and evaluate critically information about society (Ochoa-Becher, 2007).

This diversity of content is very clearly reflected in the goals of the social science curriculum. The main purposes are described for comprehensive school as supporting students to become active and responsible actors in society, they should be provided with basic information and skills about the structure and functions of society, and citizen's possibilities to have influence. They should also learn "to

obtain and use information about society and economic life critically". Furthermore, social studies should contribute to students' growth as tolerant, democratic citizens and give them experience with social action and the democratic exercise of influence.

Interestingly, although values are emphasized in the objectives, in the criteria for assessment, the value-based purposes of social studies are ignored and the criteria are classified under topics "Acquisition and Use of Social information" and "Understanding Social Information". This contradiction is probably explained by the difficulties related to assessing the goals that deal with values. (Löfström *et al*., 2010.) In fact, many of the goals of social studies, such as becoming an active citizen, will only be fully observable in the future when the students are adults, and what really can be counted as the result of social science lessons will be highly uncertain.

In the recent international study of adolescents' civic knowledge, attitudes and participation, International Civic and Citizenship Education Study 2009 (ICCS), the Finnish teachers and principals had in the questionnaire an item where they had to rank the goals of civic education. Their highest priority was "promoting students' critical and independent thinking', and the second one dealt with caring and valuing the environment. Most of the other high-ranking goals dealt with knowing and understanding society and political institutions. Such goals as participating in the local community or preparing pupils for future political participation were very lowly ranked. Only 4% of teachers and 1% of principals thought these were important goals. Very few of the respondents thought that an important goal was to develop strategies for resisting racism or xenophobia. (Suoninen, Kupari & Törmäkangas, 2010.) These results suggest that there is an obvious risk that the socio-ethical purposes of social studies are overshadowed by the emphasis on cognitive purposes. The ethical and participatory dimensions of social science education leave no doubt that there is a challenge for future development of the curriculum.

Value-related issues are very clearly ignored in the final step – as a result of the student assessment system. The assessment methods in general have recently become more versatile, more material based (using written documents, statistics and graphics). On the one hand, it is impossible to use students' values as the basis of assessing achievements at the national level. On the other hand, thinking about the functioning of the society, one may ask what the main role of social science instruction is. Is it educating citizens who know about democracy – or citizens who can act in the society? These goals are not mutually exclusive, and it would of course be worse to have citizens who do not know but act anyway. The content of social science education is fairly conventional and perhaps conservative, perhaps due to its long history as a handmaiden of history, which was long been dominated by the great national story of the Finnish nation.

However, contents related to society are included as well in many other schools subjects, such as history, geography, religious education, first language education,

ethics, science, health studies and home economics. Furthermore, citizenship education can be seen as the general overall purpose of schooling. In ICCS 2009, most Finnish teachers and principals expressed the opinion that civic education is the responsibility of the whole school and all the teachers, irrespective of subject specialization (Suoninen *et al.*, 2010). However, one distinction can be made: citizenship education in a broad sense, with its purposes that are related to socialization, is common to the whole school – but social science is a subject which aims to examine society systematically.

Geography and Geography Education

Traditionally geography in Finland is divided into the two main branches of general and regional geography. General geography focuses on things and phenomena which are based on the physical environment and are connected to man made things (the human environment) and their effects, whereas regional geography studies the world´s regions, their specific unique characteristics which are related to their nature and culture. Accordingly, general geography is divided into physical and cultural geography. The humanistic branch of the cultural geography studies among other things the identity of the place of man, regional images and interpretations of landscapes and it highlights one's personal relationship with the environment (Haarni *et al.,* 1997; Olwig & Jones, 2008). The relation between man and his environment has become even a more important study goal in physical geography, too. There are several other branches of geography, but all their research topics are connected to concepts like area, region (local, global), space and time. Therefore today´s geography is a diversified science, which connects the natural sciences, the humanities and social sciences, and nowadays it highlights similarities between the studied matters instead of differences (Mei-Po & Weber, 2003). In Finland geography in universities is taught in faculties of mathematics and the natural sciences.

Geography in Finland is a school subject that operates as a bridge between natural-science and social-science thinking (National Core Curriculum for Basic Education 2004) and it answers questions concerned with: "what (kind of), where and why?" It is important that pupils get to know in the school how to acquire geographic knowledge and how to think geographically. As a school subject, geography helps pupils to outline the connections between man-made things and the physical environment and its constructs or phenomena, thus supporting the pupils in their efforts to perceive the global entirety. This is most clearly shown during the lessons when the physical and human aspects of the geographical themes are present and the studied matters are smoothly bound together, for example in the issue of creating a sustainable environment. The main aim of geography is expressed in the following sentence of the National Core Curriculum for Upper Secondary School (2003): "Geography examines the structures and

functions of living and lifeless nature and human-made systems". The idea is that the students should become aware of the interdependencies between nature and human activity and to study the world as a changing and culturally diversified living environment. This highlights again the importance of geography as an integrating subject between the study themes of the natural sciences and the humanities.

LITERACY OF HUMANITIES (PISA, TIMMS, ICCS)

There are several studies in which the knowledge, skills and attitudes of pupils have been tested nationally and also internationally. In the earlier studies mostly the knowledge of the pupils has been tested, whereas the present tests measure more abilities and thinking skills. Firstly, some Finnish national examinations are presented here. There is an optional examination to measure the pupils' knowledge and skills in biology and geography at the beginning of Grade 7. Another voluntary geography test can be chosen by the schools or teachers. That is a final test at the end of the compulsory comprehensive school (grade 9). Not all schools have taken part in these tests so there are no nationwide results available.

Finland has participated in several international studies of learning results. In The Third International Mathematics and Science Study (Kupari *et al*., 1999) the Finnish pupils (7th grade) were well disposed towards geography and biology among sciences. The mean of the marks of the Finnish pupils was significantly above the international average in their abilities to acquire the scientific information by researching. This study also measured the students' knowledge of the environmental and natural resources where the Finns had similar results.

In PISA 2006 the main attention was on natural sciences (including geography) for the first time. The knowledge and skills of the Finnish pupils (age 15) were best in all domains of the natural sciences. The top-rated domains were using scientific evidence, identifying scientific issues and explaining phenomena scientifically. These results also indicated that pupils can solve geographical issues but the domain of human geography was not studied. In PISA 2009 the corresponding domains were examined – both the cognitive and affective aspects of students´ competencies in science – like in 2006, the Finnish pupils were the best.

During the past two decades, a number of studies have been published in Finland about adolescents' historical thinking, but we know actually very little about what really happens in the classrooms. Sirkka Ahonen (1998) has studied adolescents' historical consciousness and identity, and their conceptions of some key phenomena in national history. This study is a continuation of the Finnish contribution to the international Youth and History study (Angvik & von Borries, 1997). Ahonen presents part of its national results and also reports on the interviews of one hundred 16- and 17-year-old upper secondary school students. One of the main findings was that the national narrative was still quite strong; and the adolescents considered that the wars in 1939–1944 were the most significant

issue in national history. The author presumes that patriotism may be based more on the general historical culture in Finland, not directly on history teaching, which seems still in part to be following the objectivistic traditions of teaching. The study deals with upper secondary students but younger students perhaps do not differ very much. The actual Youth and History data from Finland, concerning 15–16 year old students, indicates that they are more patriotic than equivalent students from other Nordic countries. Their nation was very important to 65% of the Finnish respondents, and their own country to 74% of them.

Another study is Juha Vänttinen's (2009) doctoral dissertation, which was based on an ambitious teaching project with 13- and 14-year olds in a multicultural school. The author was teaching his classes and using very systematically documents, and testing how his students could interpret and draw conclusions from the material. According to the results, the source-based teaching methods were suitable for lower secondary classes. This is actually encouraging, and corresponds very well with the aims of the present history curriculum. However, it is challenging for the history teachers and requires profound expertise in both subject matter and teaching methods.

As for civic education, two large scale international evaluations (CIVED 1999; ICCS 2009), which assessed adolescents' knowledge, participation and attitudes related to society, indicate that Finnish adolescents (14-year olds) have a very good knowledge of society, but they have very weak interest in this field. Altogether 3300 14-year old Finnish adolescents from 176 schools participated in ICCS 2009 study. Finnish adolescents obtained 576 points, sharing the best position with the Danes, while the international average was 500. Girls performed significantly better than boys, but the differences between schools were very small. There were also significantly more top-level performers in the Finnish sample than in any other country, and the least percentage of poor performers. Although the results were very good already in 1999, they had now slightly improved. What makes these results even more special is that the target group in the international studies CIVED and ICCS were 14-year-olds who had not yet received systematic civic education. However, their knowledge in both studies was at the top level, which indicates that critical thinking skills and also a good deal of information about society is filtered through effectively for instance from history and geography instruction, and from school life in general. The excellent results in knowledge items are certainly due to a large extent to the schools, and in the attention given to the contents of citizenship education in general, although the achievement level is also related to their family background and their parents' interest in political and social issues. (Suoninen *et al*., 2010; *cf*. Suutarinen, 2002.)

Where Finnish adolescents do not perform well, are their attitudes toward political and social issues. They, together with among others Swedish, Norwegian and Belgian pupils, have a very low interest in political issues, and especially in political parties. Nevertheless, there are areas that are experienced as more important, mainly environmental issues. The majority of these adolescents also

think that they are going to vote in the future, but very few consider that they would join a party or be a candidate in election. They trust in the institutions of the Finnish society more than adolescents in the other participating countries on average, support equality of gender more than the international average (although males have more conservative attitudes). These adolescents in general and the girls more than boys had tolerant attitudes toward the rights of ethnic minorities.

Activating Teaching Methods

Neither of the present school curricula for history, social studies or geography articulate explicitly what teaching and learning methods should be used per se, but, instead, teachers are free to choose their teaching methods. However, The National Core Curriculum for Basic Education emphasises in the general part that teachers are expected to use methods that support the development of the skills of learning, thinking and problem solving, participation and social skills.

The present school curricula are based on an active and dynamic conception of knowledge and learning. This refers to the constructionist notion of learning as a mental activity, and the individual and social-constructivist conceptions of the formation of knowledge.

Another, related challenge is that the humanities should be taught, not as an accumulation of separate pieces of information, but as a specific way of thinking and understanding, and the task of the teacher should be to nourish the students' higher order thinking. It is one of the main challenges of teacher education to prepare the prospective history teachers to teach thinking and understanding, not only mediating information. These are challenges for Finnish schools, although teachers of history, social studies and geography already today use student-centred teaching methods fairly frequently.

As for history, the goals of curriculum have underlined skills-based teaching. Students should learn to use and interpret historical evidence, interpret conflicting sources, detect bias and understand multiple perspectives to historical questions. This approach to history education is based mainly on the British tradition of history teaching. All in all, using this method, students should learn to understand the basic of historical epistemology, the construction of knowledge on the basis of critical scrutiny, and hopefully, this critical literacy would have a transfer effect for managing the continuous flood of information in everyday life. This requires systematic and continuous practice, not only occasional episodes. Although history still is a subject based strongly on reading texts and expressing what you can through writing, reading history actually implies several forms of literacies – in addition to words, more and more about visual texts, electronic and digital media.

A good example of this working with historical documents was the teaching experiment that Juha Vänttinen (2009) constructed as the basis for his doctoral thesis. He selected sets of sources and designed tasks on basis of them, beginning

in grade 7 with fairly easy documents, proceeding to more difficult ones in grade 8. He used for instance letters written by imaginary Finnish migrants from North America, and here the pupils had to find out individual motives for migration and understand historical changes. For instance, with documents about Germany under Hitler's regime, pupils were challenged to compare contradictory sources and be sensitive to bias in the texts. In general, visual, graphic and statistical sources have become important in the practice of history teaching, which is certainly common to the humanities in general.

In geography learning through "graphics" plays and has played an important role in teaching and learning in basic education. The graphics include maps, photos, drawings, diagrams etc., but nowadays more and more use is made of computer based graphics and geographical information systems (GIS). GIS processes place information and supports especially the reading and control of the location information. Geographical information systems make it especially possible to collect information and handle materials. They also provide tools that support analysis and illustrating. They contain, in addition to location, information about property data, which determines the target and describes the properties of the target. So the place information consists of a wholeness formed by the location information, property data and contact information. The versatile use of maps also includes the presenting of the topics, which can be learnt in human geography with the map. There is a GIS program for schools (www.paikkaoppi.fi), which all the teachers in Finland can use. The versatile use of maps by GIS programs also makes it possible to present topics that can be taught in human geography with the maps and it develops the students' spatial skills.

In learning environments like www.paikkaoppi.fi spatial understanding, map skills, knowledge of the place and values are foci of learning. The following are examples of the use of the system. The city environment is usually structured by pupils via places and the meaning of the places. However, they seem not to have a personal relationship to their surroundings. To practice not to be blasé about their environment and to become sensitised to its issues the pupils are asked to take photo(s) from a place they feel is important or they like in the environment. They also are asked to write about why it is valuable for them and to link their images to the information in the "PaikkaOppi" map program. They are asked to place these photos and essays on the right place on the map using geographical coordinates and information available in the system. At the end of the practice the pupils have to tell other pupils about their chosen important place, and its connection to information available in map program or elsewhere. This type of practice can easily be connected to historical and biological knowledge of the place and it also gives an opportunity to practice computer skills and taking photos.

An example of the cross-disciplinary activity was a landscape history course arranged in one school in the spring of 2010. The course was planned jointly by the teachers of geography, history and landscape studies. The aim of the course was to study changes in landscape – how particular physical features or man-made

structures have changed over time. PaikkaOppi's map program was used to study and compare original maps dating from the 18th century to the current maps and aerial photos. Datasets were overlaid in the map program and basic visual analyses were executed. Also, the map service was used to combine the teaching of geography and literature in a special course to enhance pupils' knowledge of their own local environment's cultural history. The pupils set out in the city of Turku to look for places that might have some cultural reference. After plotting these places on the map program, the pupils added excerpts from local literature – novels and poems that were related to these places.

Assessment

Assessment in the humanities is based mainly, for example, on teacher-made school-based examinations, course work, assignments or portfolios. At their best, the exams also include tasks calling for students' own thinking and problem solving, and understanding of wider contexts, concepts or documents. According to the new assessment culture, classroom assessment is expected to be supportive and individualised, based on the principles of authentic or performance assessment.

One of the major reforms in the 2004 comprehensive school curriculum is setting up criteria for the assessment of student achievement in all subjects. The criteria for grade 9 were created as early as 1999, but in the 2004 curriculum criteria for "good knowledge of subject matter" were also set for turning-points in school, the transition for the individual student from being taught by class teachers over to being taught by subject-specific teachers. The assessment criteria only describe the standards for 'good' knowledge or skills in the subject, which practically means 8 in a scale from 4 to 10; there are no standards for satisfactory (5) or excellent (9, 10) achievement. There are differences in the criteria of subjects representing the humanities.

A special feature for the criteria in history is the emphasis on the skills of acquiring, understanding and using historical knowledge. The criteria are purely formal, indicating nothing of the factual contents that the students should adopt. The reason for this lies in a relativist notion of the significance of historical events. The formal emphasis in the criteria, and also in the goals for history teaching, is clearly influenced by the British tradition of history education (*cf.* Husbands, 2003).

The criteria for social science resemble those of history, focussing on the skills of dealing with information. Assessing learning outcomes in this subject is challenging, especially with reference to its role in citizenship education. The formative functions of assessment are most relevant, because of its role as supporting individuals' development into citizenship. This is especially true for objectives that are related to social and moral values and attitudes, such as appreciation of human rights, equality and democracy. Furthermore, the most

essential outcomes are visible long after the students' school years and thus not accessible for school assessment, while the easy targets of assessment may not be relevant for citizenship (Grant & Salinas, 2008).

In geography, the criteria for 'good' knowledge or skills are divided in several categories of which the most essential are skills in acquiring geographical information – like interpreting several kinds of maps, photographs and statistics and how to utilize news sources and information from data networks – analyzing the world, Europe and Finland and the common environment. These national, equalising criteria of the final assessment have very often been transferred directly to local curricula.

THE EDUCATION OF HISTORY, SOCIAL STUDIES AND GEOGRAPHY TEACHERS

Today, the teacher education programme is normally sandwiched between subject studies, but a gateway to teacher studies is in a few universities also open to those who after finishing their degree want to qualify as teachers. Subject studies are organised by the faculties of humanities, social sciences or science, and the teacher studies by the departments of teacher education. The teacher studies normally last only one year, which is a short time in the process of teachers' professional development. For the subject teachers in the humanities and other school subjects, the teacher studies include courses in general education, subject-specific teaching courses and a practicum. Subject didactics refers to the subject-specific component in teacher education. It can be seen as a bridge between the academic subject and education, and between the school subject and the learning individual. Thus, it is an approach combining the nature of the specific subject to the general theories of education. It is a subject focussed on pedagogical content knowledge.

The course structure and detailed contents of subject didactic can differ between departments of teacher education. The core content is, however, often made up of contents that introduce the prospective teachers to think about the nature of the school subject and its form of knowledge, as well as the thinking and learning processes related to the subjects. They are also introduced to the school curricula and their development, teaching methods and materials and student assessment. As subject didactics is related to pre-service teacher education, the practical solutions, such as teaching methods, assessment, using visuals and ICT, belong to the core content, and are in general most highly appreciated by the teacher trainees. However, this is not sufficient, if we want to support the prospective teachers' growth as reflective professionals, and to develop subject didactics as an academic domain and as a field of research. The students learn also about research into learning and teaching and write a minor dissertation. Cross-disciplinary approaches (sustainable development, global and multicultural education, active citizenship; media literacy, future studies) also belong to the curriculum.

The didactics of social sciences has so far been combined to history didactics, with the exception of Helsinki University, where there has been opportunity to

differentiate these programmes partially. Some components are common to both subjects, but there are also specific themes (the nature of social science as a school subject, students' attitudes and motivation, some practical issues related to teaching methods, relevant research). In principle, the didactics of history is more developed in Finland than that of the social sciences, and it is an urgent task for us educators to try to strengthen the preparation of teachers for teaching social science.

The nature of the geographical discipline and the contents of school geography are discussed in the didactics studies at the departments of teacher education at Finnish universities. The kinds of didactic courses available differ from university to university and on the sub-specialization of the didactics teachers, but certain basic things are taught to everybody like the importance of the graphics and maps in learning geography (Cantell *et al*., 2007). Various applications of the theory to everyday life are introduced for both subject teacher students´ and class teacher students´ studies. The students do geographical internships in their studies and they also do practical training in the teacher training schools of the universities.

Academic geography is brought into the school level via subject-specific didactic studies. In these studies the theoretical content of science is brought to the school environment. Kaivola and Rikkinen (2007) have shown that geography teaching has been under continuous change in Finland in the last decades. According to them the innovation of the academic research and higher education has permeated to schools in several ways. It is noteworthy that the trend in Finnish curriculum development has given geography teachers more opportunities to design their educational setting (Kaivola & Rikkinen, 2007). At the same time effective teaching and learning methods for geography have been introduced. There has also been better comprehension of how to make good use of everyday life geographical knowledge. In the didactics studies ways to transform the geographical content and its concepts so that pupils of different age groups can understand them are also reviewed. All these tendencies are widely presented in the set of didactics books of Rikkinen from which the newest volume came out in 2007 (Cantell *et al*., 2007). Especially the thinking skills associated with learning geography are accentuated as well as studying geography in a socio-cultural learning context and in a social frame of reference (Cantell, 2001). Naturally geography teaching is dependent on trends in society and is seldom value free.

COMMON CHALLENGES

There are certain questions which all the humanities very much have in common, and in the future the teachers will be challenged to cross subject borders, while cooperating and creating more coherent issue-centred structures to deal with the themes together. Many of the future challenges are also included in cross-disciplinary themes like the acting to achieve sustainable environments and societies, globalisation and active citizenship. An example of active citizenship in geography is the widening of one's regional identity to become an active global

citizen (Cantell, 2005). In the study of Paakkunainen (2007) only about 30% of Finnish participants felt they were global citizens and a few more than 50% felt they were European citizens. All to all "active citizenship" is a big challenge in Finnish school culture, not only because of the Finnish adolescents are not very interested in these matters according to the some research results (ICCS) but also because these issues are difficult to teach and also learn and they are also age dependent.

Cultural diversity has created a new situation for many Finnish teachers, who have to design teaching methods and approaches that are meaningful in multicultural and multilingual student groups. The situation can, however, be very different in different parts of the country. All the teachers share some of these changes, while others are more directly subject-specific. The development of intercultural competence, or culturally relevant pedagogy, can be seen as vital for subject teachers, both in pre-service and in-service education. Firstly, it deals with the guiding of all students, including those with migrant backgrounds, in their learning, secondly it affects communication in classroom situations, and thirdly it affects value issues related to school and education in general and culture particularly.

Some changes brought by multiculturalism are related to the nature of subjects and to the functions that they have in society and for individuals. Key issues are whose history, or whose geography we teach, and whose social values are reflected in the ethos of civic education. The enlarging multiculturalism in Finnish society is raising the question of what kind of geography is important to teach. This will be a new task for didactics research and an important task for geography teachers in schools, too.

In culturally diverse classrooms, there are adolescents who come from different historical cultures, representing different interpretations of sensitive and controversial current issues and their backgrounds. The growing diversity of the population challenges the traditional unidimensional history education with requirements of multiperspectivity. Although the Finnish history curriculum is not strongly focussed on national history, more space should certainly be given to global history (Virta, 2008).

The social science curriculum has in most school systems been based on the presentation of the institutions and structures in the very society, from a rather national point of view. It has been a channel of socialization into one society. This is still relevant but not sufficient, given the growth of international migration, globalization and more rapid communication (Virta, 2010). Basically, instead of citizenship education we perhaps should speak about intercultural citizenship education. It is not limited to integrating the children with migrant background to their new society but all pupils need the capacity to work and live in international contexts and multicultural societies.

In conclusion, many of the presented matters can be included in Future Education. The viewpoint of Future Education can be enforced in several subjects,

subject groups and cross-curricular themes. In Future Education the mental pictures of a worldview (philosophy of life) is used in teaching and learning. The mental pictures represent the entity of personal knowledge, conceptions, assumptions and beliefs. These kinds of information can be collected from narratives, essays and drawings. To be connected to the humanities it is important to ask: "What is the direction in which the phenomenon is developing?"

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14. ARTS EDUCATION:

Instruments of Expression and Communication

ABSTRACT

Arts and culture education has its unique role in an educational whole. In this article arts education is viewed as a means for children and young people to develop a secure sense of themselves, both as individuals and members of various groups within multicultural and diverse societies. Arts education construct abilities and intercultural competence to confront an increasingly unforeseen world as future citizens that learn to develop their creative potential and free, critical thinking skills. This article presents an outline of Finnish arts education, which consists of following separately thought subjects: visual arts, music, crafts (textile and technical), physical education and home economics. Each of them has a national core curriculum as a compulsory subject. Within this 'arts and skills' subject group, this article refers more exactly to the aims, pedagogical principles and practices of visual arts and music, which are compulsory subjects in all European school curricula at the primary level.
Keywords: Finnish arts education, visual arts, music education, secure sense

ARTS AND CULTURE IN EDUCATION

The role of arts and cultural education at school has been recently emphasized in various international contexts (see ACESE 2009, p. 7). For example, UNESCO has actively led the development of policy initiatives in the field of arts education. According to the Director General of UNESCO (1999), each stakeholder has to ensure the teaching of the arts in every child's education. The Road Map for Arts Education (UNESCO, 2006) aimed to provide advocacy and guidance for this project of strengthening arts education. This document stands for arts education helping to uphold the human right to education and cultural participation, to improve the quality of education, to develop individual capabilities, and to promote the expression of cultural diversity (ACESE 2009, p. 7).

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 209–223.
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Arts education has been given an important part in preparing children for their roles in an increasingly unforeseen world. Globalization has brought both benefits and challenges such as advancements in technology and the knowledge economy, increased migration and multiculturalism. Arts education, as a part of the education system, can be viewed as a means for children and young people at school to develop a secure sense of themselves, both as individuals and members of various groups within multicultural societies (ACESE 2009, p. 7). We refer a secure sense to individual and social expressivity and communicability in diverse (cultural and creative) texts and situations as both receiver and producer. In these roles the personal experiences and values of processing art strengthen the ability for cultural participation.

Teaching the arts is said to help children and young people to learn to handle relationships between various elements. As Eisner (2002, pp. 75–77) describes, one learns to see the interactions among the qualities constituting the whole. For example, analysing a work of art, composing music or engaging in dance requires heightened awareness of relationships, an analysis-synthesis-process concerning details in the whole. This 'problem of fit' in the arts has to be solved through personal somatic knowledge, which sets the learner in a position of authority in knowledge construction. The learner explores and decides, which are the best relationships between colours and forms in image making, for example, the artistic learning process trains abilities to shift direction, or redefine the aims of a work when better options emerge (Eisner, 2002, pp. 77–79, 82–83). This flexibility, improvisational and imaginational feature in intelligence develops forms of thinking and attitudes towards problems that are important to any field of human life.

In addition, what is characteristic for arts education is that it teaches the use of various materials as medium of expression and communication (Eisner, 2002, pp. 79–81). Learning different techniques and skills creates understanding of the potential possibilities and limits of the material one works with. Each material or combination of materials imposes its own limits, an appreciation of these limits help learners to deal with complexity in their self-regulation and thinking. Furthermore, the more experienced learners are with materials the more they grow up to be enlightened perceivers and communicators. As Eisner (2002, p. 85) states, the curriculum provides frames for reading the world. Thus, educational programmes that are effective both provide a variety of frames and develop the student's ability to shift frames.

The place and the number of arts subjects within national curricula is said to mirror the priority that is given to arts education at primary and lower secondary levels of education. In addition, many claim that this field of education can potentially contribute to a creative learning environment in schools, especially if arts subjects are "mainstreamed" throughout the curriculum and if sufficient numbers of hours are devoted to this teaching area (ACESE 2009, p. 23). Therefore, it is our aim to discuss the principles and strengths of arts education as a

part of the Finnish school-learning environment, which have made it possible to achieve remarkable PISA results in several measurable areas of educational quality.

ARTS EDUCATION IN FINNISH SCHOOL SYSTEM

The conception of arts curricula varies a lot even in the European context (ACESE 2009, pp. 15, 23–28). This is one of the reasons why the quality of arts education is complicated to measure or compare internationally. So far this has not been implemented in PISA, for example. In about half of the European countries, each arts subject is considered separately in the curriculum (*e.g*. visual arts, music, drama, dance, media arts, crafts or architecture), while in the other half, they are combined as an integrated field of study (*e.g*. the 'arts'). In the Finnish school system, arts and cultural education as a whole is very unique in its nature, as it refers to the following five school subjects, which are taught separately: visual arts, music, crafts (textile and technical), physical education and home economics. The Finnish national core curriculum for basic education (2004) specifies separate objectives and core contents for each of these subjects, although they are also grouped in certain reviews of curriculum areas by the term 'arts and skills subjects'. Each subject in this 'arts and skills' group has separate compulsory and optional parts in basic education. Besides the arts and skills subjects' group, artistic and cultural themes are naturally involved in other school subjects too (for example church art in religion and literary art in the mother tongue).

Recently, the Finnish National Board of Education implemented a large national evaluation of teaching and learning arts education in basic education. According to this research (see Jakku-Sihvonen, 2011, p. 9), pupils' attitudes towards arts and skills subjects (crafts, visual arts, music and physical education) are clearly positive, more positive than towards mathematics, mother tongue and literature or Swedish as a compulsory language. Jakku-Sihvonen proposes (2011, p. 9), that this finding should be taken into consideration in attempts to develop Finnish schools by enhancing pupils' experiences of happiness and enjoyment.

In the Finnish National Core Curriculum the arts and skills play an important role in basic education. It is not only the question of cognitive development in other dimensions, or a break from the demands of academic subjects or pure enjoyment, but also for example in improving cultural and communicative reading, producing and learning, in understanding Finnish traditions and culture and as part of individual and social growth (v. Garber, 2002). If the curriculum is read and analysed as a cultural statement, the arts education curriculum appears to have a strong influence on the whole educational system and thinking in Finland.

Giving all the arts and skills subjects a compulsory status in the curriculum - even if this means small numbers of lessons for some arts subjects - is quite a unique choice in the European context. This situation is mirrored in Europe only in Norway and the Flemish Community of Belgium (ACESE 2009, p. 26).

This uniqueness could be partly explained from a social perspective: art and culture education in Finland is strongly influenced by individual freedom acts and laws; these freedoms are stated in the Constitution. The most important constitutional rights from the point of view of arts education are freedom of expression (also relating to people's self-expression) and freedom of the arts. Young people engaged with the arts and the personal experiences and values of art making are more likely to be an integral part of a communicative society and to culturally develop as individuals.

On this basis, the structure of the present Finnish curriculum for basic education gives voice to the diverse nature of arts and skills in a school-learning environment. This richness that every pupil can share in their basic education gives different pupils plenty of opportunities to find their personal strengths as learners. It is a choice for cultural equality, every one's right to actively share and pass on a multiform cultural heritage, too. However, the total number of lessons devoted to arts education in the Finnish curriculum is only comparable with the average level within the European countries (ACESE 2009, pp. 29–31).

Arts education in Europe is mostly delivered by class teacher (generalists) at the primary level. In the majority of European countries, class teachers receive training in arts pedagogy as well as specified pedagogy in more than one arts subject. The most selected subjects are visual arts and music, which are compulsory subjects in all European school curricula at the primary level (ACESE 2009, p. 16). After grade 7 in Finland, compulsory visual arts, music and crafts education usually become optional courses in grades 8 and 9. Home economics begins in grade 7 as a compulsory subject and continues as an optional subject in grades 8 and 9. The only subject in the 'arts and skill' subject group, which is compulsory throughout the basic education is physical education. Arts in grades 7-9 are usually taught by specialist subject teachers. Subject teachers in arts and skills subjects are educated in separate universities in co-operation with teacher education units (this includes textiles and technical craft teacher as well as physical teacher education). In the higher educational programme, the compulsory teachers' pedagogical studies are arranged in co-operation with universities that have the statutory right to give degrees in educational science.

In this article, we will mainly focus on visual arts education in the Finnish school system. We will also introduce some general principles of music education, which also has the status of a compulsory subject at the primary level in the European context. The primary level is important in our case as well, because most compulsory arts and skill lessons are taught in grades 1-6 by class teachers in Finnish basic education.

AIMS OF VISUAL ARTS AT SCHOOL

In Finland, visual arts have been part of basic education for more than a century. During its long history as a compulsory school subject it has reconstructed its

identity in interaction with several paradigm shifts in arts and in learning. The subject called “Drawing” [piirustuksen opetus] changed its name in the 1950’s to “Visual skills” [kuvaamataito] and from 1999 on to “Visual arts” [kuvataide]. Nowadays, the lively discussion on the identity of this school subject highlights the role of all forms of visual culture (Pohjakallio, 2005). This self-reflective process surrounding the school subject is a natural consequence of the constantly changing and challenging nature of arts and visual culture as phenomena in society. This on-going change in arts and culture also calls for pedagogical sensibility to reconstruct the aims of arts related learning.

Today, the main tasks of visual arts instruction in basic education are to support the development of the pupils’ visual thinking and aesthetic and ethical awareness, and develop the pupils’ visual expression. Understanding the manifestation of visual culture in society – art, the media and the environment – is emphasized. The key objective of teaching is to develop the pupils’ personal relationship with art. The visual arts have been given an important role in creating a foundation for appreciating and understanding the visual world of Finnish culture, the pupils’ own cultures, and cultures foreign to them. Another purpose of this subject is also to develop the skills needed to build a sustainable future (FNCC 2004, p. 234.).

According to the National Curriculum (FNCC 2004, p. 234), pedagogically important starting points for artistic learning are the visual world of the everyday environment, sensory observations, mental images, and personal experiences. Often visual arts lessons begin with discussions based on the pupils’ personal experiences or instant observations of the studied phenomenon in the arts or visual culture. Teachers are guided to actively link the current subject areas to experiences that are meaningful to the pupils. This important link is typically strengthened by giving the pupils freedom to construct personal solutions in visual exercises.

Visual exercises, various self made images, are at the heart of every learning process, which often starts with planning and sketching. Freedom of expression and learning by doing are valued, since the objectives of visual arts teaching are to develop the imagination and promote the pupil’s skills in creative problem solving and investigative learning (FNCC 2004, p. 234). As a natural continuation to these values, personal learning experiences are often discussed and documented for example in portfolios during the lessons. Pupils learn to evaluate both the process and the product of art learning together and they learn to use concepts of the visual world. Thus, the identity of visual arts as a school subject is not constructed in the entire curriculum on the basis of domain specific contents of the subject area alone, rather on its own part in educating creative, investigative learners who will also become responsible citizens.

The main objectives in visual arts are divided between two sections (grades 1-4 and grades 5-9, FNCC 2004, p. 234, 236). During the first four years, the pedagogical approach is playful and the main purpose is to construct fundamental skills in visual expression, as well as to get familiar with materials and the ways of

the working characteristic of art. Later in grades 5-9, the role of visual culture and media technology increases in the teaching and learning process. The purpose is to deepen pupils' understanding of images as instruments of expression and communication in visual culture and improve their skills for interpreting them. Overall, the pedagogical approach is action oriented in visual arts, meaning that every learning situation must provide opportunities for pupils to interact, to work and experience art together.

CONTENTS OF VISUAL ARTS

The Finnish National Core Curriculum introduces visual arts with the following four core contents. Each of them is described here in details in the context of the grades 1-4 (FNCC 2004, p. 235), which are usually taught by class teachers;

1) Visual expression and thinking

– visual techniques, ways of expression, and materials; painting, drawing, graphics, design, and building
– fundamentals of visual composition; balance, tension, rhythm, colour, form, space, movement, time, and line
– study and evaluation of visual images and practise using the correct terminology when discussing them

2) Artistic knowledge and cultural expertise

– visits to local museums or art exhibitions and introduction to an artist's work
– studying artistic images by creating one's own images and discussing them
– masters of Finland's golden era; examples of contemporary art and art from different eras

3) Environmental aesthetics, architecture, and design

– introduction to and depiction of nature, buildings, and the building heritage, recognition of changes in the environment
– examining, designing, and making objects, three-dimensional construction, making environmental plans and miniature models

4) The media and visual communication

– fundamentals of visual narration: from story to picture, close-up and overview, combining image and text
– illustration, comic strips, advertising images, photography, video, and the digital image
– critical study and investigation of visual communication in television, computer games, films, comic strips, and advertising

As described above, for example cultural visits are formally included in the school curriculum for visual arts. Usually this means visits to museums, art galleries or other forms of exhibitions. Such visits are systematically integrated into the curriculum whenever the relevant teaching topic arises. According to a recent evaluation, Finland represents the minority of European countries, in which the link between museums and the education system is rather well developed and formalized (ACESE 2009, p. 37). However, recent research (Laitinen, 2011, p. 151) showed that according to in-service teachers, there were 15% of schools, in which these cultural visits had not yet been realised. According to pupils' opinion, in over 40% of schools these visits were not yet arranged. Although the curriculum values this kind of art teaching and learning, not every school or area has equal opportunities to implement it in practice.

Taken together, the present national curriculum constructs a rich and diverse identity for visual arts as a school subject and links the pupils' visual expression and thinking with all the other core contents. The teachers' pedagogical thinking is relied on in the implementation of this diversity. In addition, various publishers have produced guide-books for teachers and text books for pupils in the visual arts. Many of these books have been made in co-operation with in-service teachers and teacher educators and they are well in line with the present curriculum thinking (for example, Piironen & Forsman, 2006; Suvanto, Töyssy, Vartiainen & Viitanen, 2004; Heinimaa, Perttilä, Tammioja & Viitanen, 2007). Student teachers get familiar with current learning materials already during their teacher training periods in teacher education programmes.

DYNAMICS OF INTERNAL INTEGRATION IN VISUAL ARTS

One of the crucial questions for a high quality of learning and teaching in visual arts is whether teachers are able to integrate the four core contents described above in their practice. According to the National Core Curriculum (FNCC 2004, p. 234), teachers are expected to take into account the internal integration in their teaching so that the objectives for expression, skills and knowledge are realized simultaneously in visual exercises. The purpose is to integrate different content areas in various combinations in each exercise and not to leave any of them out or disconnected from the whole. As a result of this internal integration principle, teachers have possibilities to create larger thematic wholes in knowledge processing, which toughens up the relaxed atmosphere in art learning.

However, for example media and visual communication still seems to have some challenges in terms of integration in school learning. For example, 54% of ninth grade's pupils reported that they had had no opportunities to process digital images during their visual arts lessons at school (Laitinen, 2011, p. 118). In addition, 62% of the pupils claimed that they had never made video films at schools (Laitinen, 2011, p. 118). Nonetheless, media and visual communication was the content area in which pupils managed best in tests (Laitinen, 2011, p. 130),

which as a coexistent result might reflect the role of informal learning environments in the pupils' everyday lives. Another aspect worth noticing is that in young pupils' thinking, the teaching of media and visual communication is perhaps concretely linked to use of certain technical equipment or instruments, while in teacher's pedagogical thinking important contents of media and visual communication can be processed in many other ways as well. Instead of underlining the management of single techniques or instruments, our curriculum emphasizes the development of pupils' visual thinking and expression.

Thus, the principle of internal integration in teachers' pedagogical thinking is much more complicated than confirming whether every content area in the curriculum is implemented in practice. A high quality of internal integration results in meaningful wholes, multifaceted exercises in the direction of several simultaneous objectives. The quality is based on teachers' professional understanding of what is relevant for both their pupils and the diverse nature of the subject domain.

This professional understanding of the visual arts subject domain has been developed in Finnish discussion by several researchers. For example, based on Efland's work (1983/1998; 1995), Räsänen (2008) introduces four different models of visual arts teaching, which open new possible levels for integrative pedagogical thinking by a visual arts teacher. Each model is based on a combination of four elements. The varying elements are a conception of art, a conception of learning, a conception of a child's visual development and a conception of interaction in the teaching-learning process. Each model has a different key idea in art teaching, which puts the elements together. Alternative key ideas are named "Self-Expression", "Form", "Imitation" and "Visual Culture". For example in the 'Imitation model', the conception of art is mimetic, which values imitation skills in making and learning art. Teachers might guide a learning process, which emphasizes visual perception as a central theme. While in the "Self-Expression model", the idea of art is premised on free and creative expression of thoughts and emotions, not necessarily using any figurative elements in visual communication. The teacher's role and the learner's focus in art learning are completely different in these alternative approaches. Thus, dynamic internal integration means that teachers are capable of varying their background thinking when planning visual exercises over a school year. As a result of eclectically combining different approaches in art teaching pupils get a secure sense and deeper understanding of what art is and visual culture as a learning environment in life.

SECURE SENSE THROUGH SOUND AND MUSIC

Music has a long history in Finnish school system, although the term music has only been used in this context mainly from the 1960's. Earlier this subject was called "singing" [laulu] which indeed was the primary content of the subject. The transformation from singing to music was driven by a wider shift in society;

urbanization, advances in modern technology and sound production, and the proliferation of the popular music among other things.

The main aim in school music of the 21st century is to encourage learners to engage in musical activities and challenge them to express themselves by using music and sound. As in visual arts, the key objective of teaching is to develop learners' deeper understanding and personal relationship with music (as a part of culture, as an art form) and sound (both natural and technological).

Music teaching is highly action oriented in Finnish schools, and the background philosophy lies in the idea of learning-by-doing. As it states in the National Curriculum "the tasks of music instruction are to help the pupils find their objects of interest in music, to encourage them to engage in musical activity, to give them means of expressing themselves musically, and to support their overall growth" (FNCC 2004, p. 230). This rarely includes individual instrument training but group playing and practising several 'school instruments' (rhythm instruments, recorder, xylophone, keyboard, guitar, bass, drums). [2]. Also the traditional Finnish instrument, the five-string kantele is also played in many classrooms all over the country.

Musical action in the classroom typically reflects the modern music cultures allowing from the students' point of view a very open and updated perspective to music in general. In practice, this means also singing and playing songs and music (and other sound material) children and young people are familiar with. This approach opens the possibilities for learners to realize music's links to different times, cultures and societies. The meaningful experiences gained through making and listening to music constitutes a foundation for understanding and conceptualizing music. Very often this is also the route to learners own sound experiments and music production. Music making and learning through action also gives many opportunities for developing pupils' various social skills such as co-operation, patience, responsibility, pluralism, and cultural sensitivity.

Although musical action has been captivated in the implementation of music in the classroom and it has been emphasized lately in Finnish music education (Juntunen, 2011), listening to music also plays an essential role in music teaching, as Hyvönen (2011, p. 14) remarks. According to Hyvönen, listening to music as an aural experience constructs the concept of music as a living, dynamic cultural form.

The main objectives in music curriculum for grades 1-9 are divided into two sections (1-4 grades and 5-9 grades). During the first four years, the purpose of music teaching and learning is to understand individuals as hearing and singing persons who have all the potential and capacity for music making. The target should be attained by using multiple ways of learning: exercises using the voice, playing different instruments, creating, improvising, composing, listening and performing. Voice control and vocal expression as well as playing together, listening, and experimenting with one's own ideas continue during grades 5 to 9.

In Finnish schools, music is typically taught by a class teacher through grades 1-6 and a subject teacher through grades 7-9. The music teacher's role in the school community also often involves the planning and implementation of school shows. During the past decades school shows have been a characteristic component of the Finnish school system, and they are still important parts of the school tradition especially in early June (at the end of the school year). Music then has an integral part in celebration as well as cultural knowledge and tradition.

It can be stated that music education in Finnish schools is based on social interaction, musical communication and sound experiments. At its best, music in schools strengthens children's and young people's personal development and competence as musically thinking members of a creative society.

HANDS-ON ART FOR CLASS TEACHER STUDENTS

In this section, we introduce some arts pedagogical ideas realized in class teacher education at the University of Helsinki. We base our two examples of visual arts and music education on current discussion about the nature of the learning process in arts. In recent decades in Finland, the learning process in arts teaching has often been premised on the experiential learning model adapted originally from Kolb (Kolb, 1984; see for example Sava, 1993; Räsänen, 1997; 2000). The learning cycle starts with concrete personal experiences of the phenomenon. The process continues with reflective observations, which make possible the abstract conceptualisation of experiences. The new understanding of the phenomenon creates new perspectives for active experimentation by doing, which again creates new personal experiences of reflective observation. What is crucial for learning about the arts is that the cyclic model combines the learning of skills and knowledge, observation and action, as well as personal and social, rational and emotional, material/concrete and abstract in the construction of knowledge.

In class teacher education, teacher educators face great challenges in trying to master the described diversity of curriculum thinking in the rather short time devoted to studies of didactics in arts and skills subjects. For example, at the University of Helsinki the basic course in didactics of visual arts is 3 ECTS. At the same time, researchers have stated that there is concern about the rather narrow views of visual arts among students in generalist teacher education (Räsänen, 2005; Kairavuori, Rusanen & Collanus, 2008). In addition, according to the Finnish National Board's research, the outcomes in visual arts learning are at the end of the basic education at most of an average level (Laitinen, 2011, p. 150). Therefore, it is necessary to strengthen studies in visual arts and its didactics within class teacher education in order to improve the quality of visual arts learning and teaching in schools (Laitinen, 2011, p. 152). Overall, consideration should be given to providing sufficient resources for visual arts instruction in order to enable implementation of the whole curriculum (Laitinen, 2011, p. 153).

Thus, educating competent teachers of arts includes vital personal experiences and shared reflective observations in order to conceptualise and understand the core didactics in arts, and its teaching practice. Class teacher students are positioned as active, responsible learners of the artistic processes in order to boost competence, authority and accountability in pupils' art learning at school. For example, to access the dynamics of internal integration in the planning of each visual exercise, students take part in a process of making a big comic strip album together in the basic course of didactics of visual arts. Students are asked to innovate their own way of recycling some elements from a work of art representing the Finnish Golden Era in art history in order to reflect their own visual arts teaching and learning experiences in their school history. Each of them chooses one work of art to study and to use in telling their personal story. Every student learns to apply some fundamentals of comic strips and the technical skills needed in visual expression and communication.

The album process serves as an example of internal integration, creating a larger learning process, which combines objectives for expression, skills and knowledge simultaneously in one visual exercise. Furthermore, the process combines the aims of different curriculum content areas as well. The theme of the album is within the frame of the content area known as 'Artistic knowledge and cultural expertise'. The comic strips represent the content area called 'Media and Visual Communication'. By drawing the comics themselves, the students enter the content area termed 'Visual expression and thinking'. Other levels of internal integration join in process, when students learn to integrate different ideas of art; art as mimetic skills (realistic master paintings from the Finnish Golden Era) and art as personal expression and social communication within popular culture (the comics world in contemporary art and in the everyday visual environment). The personal experience of the album process is monitored pedagogically together step by step by studying the phases of the artistic process from planning to products. Experiences of success and problems faced at different phases are analysed and discussed together, which is an on-line-construction of visual arts pedagogy in interaction with personal experience and social knowledge. This process opens the pedagogical discussion on the principles of pupil assessment as well. The experienced process serves as an authentic learning material for discussion of the learner's active role in assessment, which is a supportive and guiding force in art learning.

Respectively in music, shared processes and hands-on learning for class teacher students could be carried out in the compulsory or optional courses on music didactics. For example the following idea of a 'paper symphony' is based on shared, artistic expression as well as creative and collaborative music making. With modern digital technology, sounds can be easily recorded and edited. In the classroom many different sound experiments can be implemented by using the free digital sound recording and editing program called Audacity. One example is the paper symphony.

The paper symphony is based on the students' discover of sounds made by many different paper materials (*e.g*. baking paper, tissues, various wrappings, cardboards, packages). Students can invent and test how to produce different acoustic sounds by touching and processing materials in several ways. After discovering different sounds, students will be asked to pick one of their favourite sounds they can produce with their paper technique. Each student will record his/her own sound with Audacity (short samples) to the same project file. After recording many samples the idea is to 'compose' a symphony together by using this 'raw paper sound material'. This can be done by organising and editing the sound samples. The editing process requires negotiating and testing the order and quality of the sounds: Which are parallel sounds, which of them will come first, which sounds will follow and how can the rhythm and dynamics of the symphony be constructed? In addition to arranging sounds, the sounds will be used as effects as well. The basic structure of the paper symphony can follow the classical symphony model consisting of three parts: fast - slow - fast.

Expressivity and communicability can also be seen as part of a shared target – an effort to integrate art subjects within class teacher education. For example, circumstances allowing, the comic strips student produce can act as a manuscript for a digital story where the paper symphony forms the basis for a soundtrack. Integration between the arts and skills subjects and also with the other school subjects seems to a recommended future trend by the education authorities (Laitinen *et al*., 2011, p. 243).

ARTS EDUCATION VISION: WE HEAR THE FUTURE

If the place and the number of arts subjects within national curricula is said to mirror the priority that is given to arts education, the mirror is also the content of those subjects. The quality and functionality of the curriculum needs to be considered also as a content mirroring the cultures and societies around. Our cultural futures will certainly have to deal with a more globalized and digitalized situation than ever before. The concept of arts is changing too. The one vital element behind the success story of Finnish schools is the capability and willingness for transformation within each art subject – yet honouring the tradition and heritage. We are not setting too rigid frames for reading the world, and in the reading processes we value diverse cultural and creative texts and situations. The teaching substance and pedagogical practices are not set in stone. The transformation within the arts is expressed with comprehension of the needs of cultural change.

Within the progress of digital technologies and especially interactive media, art needs to be seen more as a social skill. Hopefully, the basis of the information and knowledge society will be founded on human, social and creative capital. People engaged with the arts, with the personal experiences and values of art making are most likely to better prepared and mentally equipped for this challenge. The

foundation of basic education needs to forge a broad enough front to assure that the students will be able to develop cultural, creative and artistic thinking, knowledge and expertise, as well as social interaction and communication.

These principles actually follow the Seoul Agenda by UNESCO (2010). The Seoul Agenda is a guide for the member states to implement the action items in a concerted effort to realize the full potential of high quality arts education. According to the agenda states could renew educational systems through art education, achieve crucial social and cultural objectives, and ultimately benefit children, youth and life-long learners of all ages. The Seoul Agenda includes three goals for the development of arts education in general. It seems that the Finnish arts education has followed these principles throughout the last few decades, and systematically developed the curriculum and its implementation from these perspectives:

> Goal 1: Ensure that arts education is accessible as a fundamental and sustainable component of a high quality renewal of education.
>
> Goal 2: Assure that arts education activities and programmes are of a high quality in conception and delivery.
>
> Goal 3: Apply arts education principles and practices to contribute to resolving the social and cultural challenges facing today's world (UNESCO 2010).

The culture of the 21st century is radically changing. The matter of culture creation is no longer solely in the hands of experts or authorities. Arts education can be understood as one of the core elements in a shared process of culture renewal; Arts education could be considered as a basis for the whole cultural and social orientation of empowered future educators and learners. From this point of view, opportunities to develop arts education in general schooling has become one of the priorities for future educators and education policy makers. This vision implies a different kind of attitude, thinking, and integration also from viewpoints many people in education are not used to. In the background of miracles are often good, forward-looking choices.

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PART IV REFLECTIONS:

FUTURE SCENARIOS AND INVESTMENTS FOR PATHWAYS OF SUCCESS

TAPIO TOIVANEN

15. DRAMA EDUCATION IN THE FINNISH SCHOOL SYSTEM:

Past, Present and Future

ABSTRACT

Theatre is an example of an art form, which has always been part of the Finnish school system, although it has not had an official position in the National Curriculum. Nowadays we have many PhD theses that confirm that the use of drama in educational processes aid personal and social development, as well as the development of self-concept, self-discrepancy and a role-taking ability. Pupils who take drama classes enjoy school activities more, are much more willing to participate in them, are better at problem solving and better at coping with stress. They have significantly more tolerance towards other people. At the same time the potential complexity and diversity of creative processes in drama education is a challenge for teachers and teacher education. The use of drama education can be seen as an alternative to scripted schooling and also an answer to the main challenges of the postmodern knowledge culture, which aims for deeper conceptual understanding by preparing students to create new knowledge.
Keywords: drama, drama education, class teacher education, creative teaching

PAST: THEATRE AND DRAMA TRADITIONS IN THE FINNISH SCHOOL SYSTEM

The Finnish school system has a strong tradition of school theatre that still persists. The school theatre roots in Finland extend as far back as 1550 to the first monastery schools in Turku (Tiusanen, 1969, p. 31-32). Theatre has always been a part of the Finnish school system, although it has not had an official position as a subject in the core curricula. Between the 60´s to 90´s there was the "Funny hours" tradition in primary schools where pupils were able to present their own performances once a week. Also, a total of 81 published school theatre play books included almost 1400 school theatre plays, between 1910-1979 tells us something

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 227–236.
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about the importance of school theatre activities (Tiusanen, 1969; Majapuro-Joutsamo, 1980; Toivanen, 2002).

The ideas of drama in education spread to Finland from Great Britain and Scandinavia in the early 70's. The Creative Activity in Schools Association was founded on Feb 17th 1972. The association organized drama training for teachers and translated drama literature into Finnish (Karppinen, 1993, pp. 82–85). Its purpose was to support and develop creative drama as part of Finnish school education. Drama practice was influenced by liberal personal development doctrines. The development of personality and free self-expression was taken a priority in education (*e.g*. Slade, 1969; Courtney, 1974; Way, 1967; Bolton, 1979). Drama activities were focused on developing teaching methods for creative expression and group dynamics instead of performing school theatre plays.

Drama teaching in class teacher education began at the Universities of Jyväskylä and Helsinki at the end of the 1980´s. The drama-educator training programme for class and subject teachers started at the Open University of Jyväskylä and the Finnish Theatre Academy´s Continuing Education Institute in the 1990´s, and led to the first drama and theatre pedagogy PhDs graduating in the early 2000's. Drama education has become an academic discipline in Finland. Didactics as the applied educational methodology of a subject area, and accompanying theoretical reflection about it, are at the centre of teacher training today. The concepts and forms of drama education have been structured to use drama and drama education as the basic terms in teacher education (Laakso, 2004; Heikkinen, 2002; 2005; Toivanen, 2010). An exception is "Basic Education in the Arts" that differs from compulsory education in schools. Basic education in the arts system includes the following nine different art forms: music, literary arts, dance, performing arts (circus and theatre) and visual arts (architecture, audio-visual art, visual arts, and craft) and it has its own national core curricula also devised by the National Board of Education. Education of theatre arts is goal-oriented, progressing from one level to the next (Curricula for Basic Education in the Arts, 2002) and in education of theatre arts the term theatre education instead of the terms "drama" or "drama education" is used.

PRESENT: DRAMA EDUCATION IN FINLAND IN THE 2000'S

Drama in the Finnish National Core Curricula for Basic Education (2004) is placed within the subject "mother-tongue and literature". Mother tongue is defined as an informational, skill and artistic subject, which is divided into three sub-areas; reading and writing, literature and language and interaction skills. Drama objectives and core contents are included in the sub-area of interaction skills. The interaction section involves the teaching of linguistic and physical expression skills with the help of discussion, narration, play, drama and improvisation. The curricula have no precise description of the objectives and core contents of drama education. The objectives are mainly focused on interaction skills. This has led to an

interaction and literacy-focused education, where drama is mainly focused on improving speaking, listening and argumentation skills.

Systematic drama education is still not implemented in every school in Finland, even though drama educations methods, forms of activity and concepts have been progressively developed and structured, especially since the beginning of the twenty-first century by many drama and theatre pedagogy PhDs (*e.g*. Sinivuori, 2002; Toivanen, 2002; Rusanen, 2002; Heikkinen, 2002; Laakso, 2004). Heikkinen (2005, pp. 14-25) defines drama education in the school system to mean all forms of theatre; performing theatre, participatory theatre and applied theatre put into practice in the learning environment. The division into different theatre genres is based on the definition of the roles of the participants and the viewers that arise from the origin or the presentation process. Performing theatre (*e.g*. school theatre) has traditionally been divided into performers and audience. The viewers are the recipients of the actions. In applied theatre (*e.g*. forum theatre) the artists involve the audience while in participatory theatre (*e.g*. classroom drama, process drama) the border between the performers and the audience is partly or completely obliterated. The active involvement of the participants in the drama process is essential in participatory and applied drama. All forms of theatre in the field of education are named genres or, in other words, forms of activities.

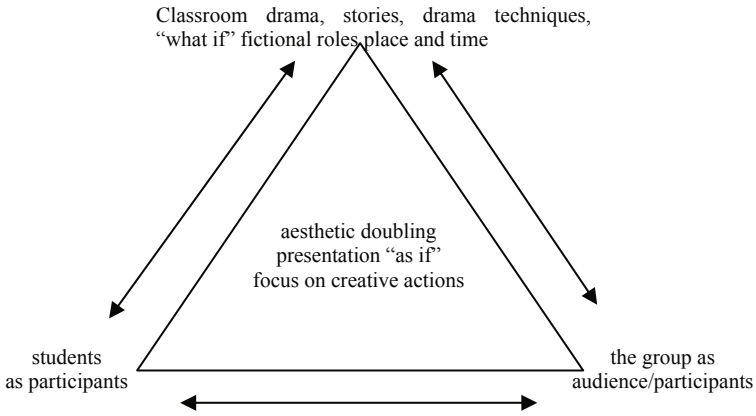

Figure 1. The triangle model of drama education (Toivanen 2010; Toivanen, Komulainen & Ruismäki, 2011)

The triangle model of drama education is based on combining the learning power of fictional situations and stories (what if) that enable students as participators to take on characters (presentation) in situations and stories "as if" they were real. Using drama techniques and roles turn the fictional "what if" situations and stories

into a living “as if” experience for pupils. At the centre of all drama is the use of our natural capacity to imagine ourselves differently. This imagining begins from “what if”: imagining ourselves in different times, places and roles. Real-life situations and stories give us the “what if” needed for imaginative drama work to begin. They provide us with a context and with characters and problems that need to be resolved or understood. Presentation with drama techniques moves us quickly to “as if” behaviour, as if we were in a different time, place and role (Bolton, 1998, pp. 262–265, 277; Cooper, 2010, pp.17–18). Being in roles enables pupils to safely try out and experience what it might feel like to speak and act as someone else. The possibility to pretend to be someone else, the aesthetic doubling, is the power of drama. Drama offers an active dimension for learning about “as if” real-life situations in education. By taking the roles of characters in situations and stories, students are able to behave as if they were inside the situation, facing the same experiences and problems as the characters. Because there is not an external audience, drama lets pupils safely play and share out issues and past or future experiences that are disturbing or exciting to them in real life, rehearsing and resolving them with the group (participators).

Drama education represents the concepts of experiential and socio-constructive learning. The purpose of drama in education is to create an interactive and positive learning environment in which the participants' construction of knowledge and learning takes place through functional and interactive social relationships. This is important because although Finland has been placed first in the PISA rankings, results from measures of thriving in school have been at the low end of the scale (Konu, Lintonen, & Rimpelä, 2002; Konu & Lintonen, 2005). By alternately acting in a role and as themselves, the learners acquire operating experiences and create new knowledge of the phenomena that are being reviewed (Kolb, 1984). The idea of socio-constructive learning is that learners are self-guided in fictitious symbolic interactions that reflect the phenomena internally and externally (Kauppila, 2007). The learner perceives the phenomena first-hand but strengthens what is being learned through social interactions. In social interaction the learners can outsource their own thinking and reflect on it with the other group members. The concept of socio-constructive learning stresses the development of identity and the perception of the values of the goals. A long-term goal in drama education is to help learners understand themselves, others and the world in which they live. Regardless of the approach, artistic learning in drama education should be emphasized because it offers opportunities for learners to create their own drama representations. This implies that the different forms, methods and conventions of drama are taught widely and in various ways to enable learners to interpret the reality of meanings (Bowell & Heap, 2001; Heikkinen, 2002; 2005; Joronen, Konu, Rankin & Åstedt-Kurki, 2011; Joronen *et al*., 2008; Laakso, 2004).

PRESENT: DRAMA EDUCATION IN TEACHER EDUCATION

Drama education is already part of the class teacher education in Finland. The extent of drama studies varies in different universities from basic studies (1-5 ECTS) to minor subject studies, the extent of which is 25 ECTS. The goal of the drama educational process in teacher education is to develop both skills in drama methods and teacher-pupil interaction, the abilities to be present in the dialogue and to listen to the group (see Kara & Cam, 2007; Dickinson & Neelands, 2008). Drama skills cover a wide area of drama techniques incorporating physical movement, vocal action, and mental concentration. The goals of drama as teaching methods in teacher education can be seen (Toivanen, Komulainen & Ruismäki, 2011):

- To increase awareness of the teacher student's self (mind, body and voice) and others (collaboration and empathy);
- To increase the interaction skills of teacher students; to improve clarity and creativity in the communication of verbal and nonverbal ideas;
- To increase the understanding of human behaviour, motivation and diversity in educational situations.

The purpose of drama in class teacher education is to create skills teach drama and to improve the quality of learning. Drama is used to extend the worldview of the students and deal with difficult educational situations in a safe environment while analysing them together (see Bowell & Heap, 2010; Dickinson & Neelands, 2006; Colantonio, Kontos, Gilbert, Rossiter, Gray & Keightley, 2008). Teacher students gain experience in various roles (teachers, parents, pupils etc.) that explore human tensions and conflicts with drama conventions and techniques. Drama has both an emotional and intellectual impact on the participants. It holds up a mirror for us to examine ourselves and deepens our understanding of human motivation and behaviour. It broadens our perspective through stories that portray life from different points of view (Laakso, 2004; Howard-Jones, Winfield & Crimmins, 2008, pp. 187–200). By training creative teaching skills with drama in teacher education, teacher students get new experiences and through them they can reshape their mental pictures and representations of teaching reality. Howard-Jones et al. (2008, pp. 199–200) highlighted in their study that even a short drama intervention helps trainee teachers show progression in their attention to and understanding of creative cognition in the classroom.

As Kansanen and Meri (1999, pp. 107– 116) have mentioned, a skilful teacher operates on two levels, the didactic and the pedagogic. The didactic level is the teacher's relationship with the subject, and the pedagogical level is the teacher's relationship with the pupils. The meaningfulness of education and work enjoyment is based on the mastery of both levels of education. An ability to react to

educational situations only gradually develops into a quick intuitive operation (Gladwell, 2006, pp. 133–135). Intuitiveness is one aspect of creative teaching. A beginning teacher needs routines, but he or she also needs the ability to flexibly apply them (Sawyer, 2004, p. 18). Teachers using drama in education especially need the ability to move away from structured routines and lead disciplined improvisation sessions in educational situations.

Teacher's work in drama education is challenging especially in the beginning (Toivanen, Rantala & Ruismäki, 2009; Wales, 2009; Dickinson & Neelands, 2006, pp. 35–41, Stinson, 2009). In most other school subjects, pupils' working, movements and interactions in classrooms are controlled. The teacher controls the pupils' behaviour by the layout of desks, teaching materials and scripted teaching methods (Sawyer, 2004). Movement around the classroom is restricted by the teacher's instructions. In contrast, the whole class drama teaching usually takes place in an open space. Teachers who use drama need to be able to manage time, space and bodies in an open room and to do so both in the social dimension of the classroom and in the aesthetic dimension of the art form (Neelands, 2009, pp. 41–42). There has to be recognition and facilitation at the same time. To become a teacher that can use drama in education requires skills and knowledge of drama and group dynamics. Toivanen, Rantala & Ruismäki's (2009) study was an attempt to create a picture of young primary school teachers' experiences of using their drama teaching at the beginning of their career. The respondents had graduated from the University of Helsinki. All four of the young teachers who took part in the study, had completed minor drama education studies (25 ECTS) as part of their primary school teacher studies. The drama studies affected the formation of the interviewees' professional identity. The four primary school teachers in the study had, in one way or another, peak experiences in their drama studies, which affected the formation of their professional identity. The young teachers that were examined were in their own opinions moving towards teaching more creatively. Although the role of drama was still to some extent hidden because of their limited work experience, the teachers were confident that they would use drama in their future teaching careers. Their profile of themselves as drama educators was an essential part of their own self-concepts as teachers. Drama was seen to be an important part of their schoolwork.

FUTURE: CHALLENGES OF FINNISH SCHOOL SYSTEM AND DRAMA EDUCATION

Increasing multiculturalism, socioeconomic differences and fragile families all produce segregation in society, which is also reflected in schools. They pose challenges for the Finnish school system in the future. They affect children and young people's well being in schools (Rimpelä, Fröjd & Peltonen, 2010). Comprehensive school is the place where pupils in all social classes and cultural backgrounds meet and work together. Drama is an art subject and method that can

be used to shape groups in school classes' emerging structural factors as well as the social competence of the group members (see Junttila, 2010), thereby helping group members to feel secure and enable school classes to perform their basic tasks better. The structural factors of a group, i.e., its norms, roles, statuses, communication in the group and group cohesion, are phenomena that occur in the interactions among the group members and affect those interactions (Pennington, Gilen & Hill, 1999, p. 358). The structural factors are closely related to the components of social relationships and self-fulfilment, learning environment, leadership, student-teacher relationships, group action, the opportunity to develop self-esteem and the chance to make a difference, which were defined in a school well-being study by Konu (2010, pp. 15–18). Several studies (*e.g*. Cooper, 2010; Catterall, 2009; Wright, 2006; Laakso, 2004; Toivanen, 2002; Rusanen, 2002; Gallaher, 2001) have indicated that using different forms of drama education can affect the development of an individual´s social competence and also the development of groups. These researches confirm that the use of drama as on art subject and educational method in educational processes develops personal and social skills, as well as self-concept, self-discrepancy and role-taking ability. Pupils who had participated in drama education have been found to feel more confident of their communication skills and are more likely to feel that they are creative. These pupils enjoy school activities more and are much more willing to participate in them, and are better at problem solving and coping with stress. They are also significantly more tolerant towards other people. They are more empathic; more concerned about others and are more able to change their perspective. In drama sessions, the group and teacher collaborate together to determine whether to accept a proposal, how to weave that proposal into the drama process that has already been established, and then how to further elaborate on it. Drama education is based on negotiation and dialogue with a class, which can stimulate creativity and enjoyment in educational processes for both teachers and students (see Dickinson & Neelands, 2006, pp. 1–2; Howard-Jones, Winfield & Crimmins, 2008).

An expert group "Basic education 2020" (2010) formulated a proposal for the next national basic education curriculum which was strongly based on what was envisaged as required future civil skills, and the knowledge and expertise students should master to succeed in work and life in the 21st century. One of the Expert group's proposals was to improve the status of and training in drama. They proposed drama as a new school subject in the Finnish school system for the next national curriculum. The main objectives for drama as a school subject was to encourage promote and develop student's skills to express themselves through drama and theatre and to be able to interact constructively with different people and groups. In order to develop drama and theatre education and pupil's skills in a systematic and meaningful way, drama should be separated from mother tongue instruction. The expert group's proposal is still just a proposal, but as already stated; drama instruction in many ways can tackle the future educational challenges Finnish teacher education and its school system will face. When the next

generations of teachers get the capacity to teach and understand drama in teacher education, it could also be used most effectively as a methodology for the exploration of issues and the teaching of all subjects and cross-curriculum themes, which can be used to develop pupils holistically. Drama deserves to be an independent school subject in the national core curricula.

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16. ICTS IN A SCHOOL'S EVERYDAY LIFE

ABSTRACT

The ICTs at School's Everyday Life Project is a national project carried out by the Finnish Ministry of Transport and Communications, the Ministry of Education and the Finnish Board of Education in co-operation with industry and commerce. The project was included in the Finnish government programme and National Information Society Policy of Finland. The aim of the project was to create a national educational technology plan and the vision was that Finnish schools will have models and practices to use ICT innovatively for wide dissemination to all Finnish schools. The project aimed to produce new knowledge and know-how for schools and educational administrators about the latest developments in ICTs, but more importantly also to develop the educational use of ICT in a multi-dimensional way. This article presents some background knowledge and strategic guidelines contained in the National Educational Technology Plan (2010) and discusses their implications in schools' everyday lives.
Keywords: Educational use of ICTs, media culture, media education, strategic planning

MEDIA CULTURE IS PART OF CHILDREN'S EVERYDAY LIFE IN FINLAND

Communication technologies and the world of media are ubiquitous in Finnish society today, permeating working life, services, leisure pursuits and societal structures. The development of information and communication technologies (ICTs) and different media figures prominently in many ways in our everyday lives, where new forms and social uses of media emerge constantly. In a reflection of this trend, Finnish educators and decision makers have seen opportunities for using ICT in teaching and learning improve dramatically in the last decade.

Media culture, the different ways in which media are used and the tools for using them become an established part of children's lives in Finland when they are

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 237–248.
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as young as 7 or 8 years old. Children and adolescents use the Internet, a range of social networking services and cell phones; they use their phones to take pictures and listen to music, watch television and play numerous games. ICT and media play a significant role in developing the competences and skills of children and adolescents, moulding their view of their world in the process (Kangas, Sintonen, & Lundvall, 2008; Kotilainen, 2011, pp. 68–70).

In the course of the last five years, social media and advances in mobile tools have revolutionized the use of ICT on the ground. Today, every school and municipality can tap the working methods based on collaboration and intense personal experience that the literature of the field has been talking about for the last ten years.

The services offered by social media claim large numbers of users and the applications in this area are used for many purposes. The Finnish IRC gallery has over 450,000 registered users, and young people submit some one million comments a day. In the summer of 2010, Facebook reported that it had broken the 500 million-user mark; the social network service has 1.9 million users in Finland. Younger children spend their time in Habbo, which record six million logins a month. The most popular social media service among children and adolescents is YouTube, used for sharing video clips. In the spring of 2011, the service offered an utterly astounding three billion video clips daily. Also huge success of a puzzle video game called Angry Birds by Finnish computer game developers shows how important part ICTs plays in people's everyday life. The game has already 500 million downloads across all platforms. And the phenomenon does not seem to be a passing fad—quite the contrary. New applications, services and ways of using media emerge constantly, as old ones fall out of use.

Why is it that the use of social media services and network communities are so popular among children and adolescents? The first explanation often put forward is that the technology is easy to use. Little or no technical know-how is needed. Users also value the opportunities to exercise creativity and self-expression and to be part of something. If she or he wants to, everyone can be an active agent or player on the net, not merely a consumer or user of material produced by others. One hears the word "produsage", meaning that the users themselves, or in collaboration with their friends, can produce and create content that reflects their interests. Every user has the chance to be an active communicator, sending information in addition to receiving it. With a single click, one can easily produce content to be explored and admired—by both a global audience and one's best friends. Many Net phenomena also function as important topics of conversation and sources of humour and entertainment in young people's media culture. (See *e.g.* Kynäslahti *et al.,* 2007; Kalliala & Toikkanen, 2009).

THE RATIONALE FOR ICT: 21ST CENTURY SKILLS

Discussions of the reform and development of the schools and teaching in Finland focus on the skills needed in the twenty-first century or the skills citizens will need

in the near future. The proposal put forward by the Finnish Ministry of Education and Culture regarding the general national objectives and the distribution of lesson hours for basic education (2010, p. 14) summarized the skill set of the citizen of the future as follows: 1) thinking skills, 2) ways of working and interaction, 3) crafts and expressive skills, 4) participation and initiative, and 5) self-awareness and personal responsibility.

The definitions used in the International Assessment and Teaching of 21st Century Skills (ATC21S), a project conducted at the University of Melbourne, are based on extensive international collaborative research. ATC21S divided skills into four categories: 1) ways of thinking, (*e.g*. critical thinking, creativity, problem solving); 2) ways of working, (*e.g*. communication and collaboration); 3) tools for working (*e.g*. information and communications technology (ICT) and information literacy); and 4) skills for living in the world (*e.g*. global agency, social responsibility). Ahonen, Vahtivuori-Hänninen, & Kinnunen (manuscript); National Educational Technology Plan 2010; Basic Education in Finland 2020). Gardner (2010) highlights the following five types of intelligence, or minds that will be needed for the future: 1) the disciplined mind, 2) the synthesizing mind, 3) the creating mind, 4) the respectful mind, and 5) the ethical mind.

This conception of the skills for the future challenges the way the schools teach, process and disseminate knowledge and develop skills today. The curriculum used in basic education in Finland today is often criticized for an excessive focus on content and the presentation of information that is broken down by subject. Does this curriculum afford pupils sufficient tools for achieving the objectives set? Does it make use of and construct the knowledge processed in school in a manner that will help pupils understand everyday life, or do pupils merely have to reproduce information which has been spoon-fed to them in textbooks and which may remain superficial and irrelevant to them (Vitikka, 2010; Ahonen *et al*. (manuscript).

In Finland, the issue of twenty-first century skills has figured very often in research and development projects on the use of ICT in teaching (e.g. Basic Education. 2020; Education and Research towards information society report; Salo, Kankaanranta, Vähähyyppä & Viik-Kajander, 2011; National Educational Technology Plan, 2010; Kankaanranta & Vahtivuori-Hänninen, 2011).

Educational administrators and other decision-makers in that sector are of one mind that teaching would do well to make more versatile and appropriate use of ICTs and the opportunities it affords for developing the skills and competences that will be needed in the future. People are also looking to ICTs for help in renewing the working culture of schools, in supporting a sense of community and collaborative learning and in building learning and studying environments (National Educational Technology Plan, 2010; Ahonen et al., manuscript).

WILL SCHOOL FADE OUT OF YOUNG PEOPLE'S EVERYDAY LIVES?

How can we best take advantage of ICTs and media to improve teaching and learning environments? Or should we ignore the issue completely? Some have claimed that schools will drift farther and farther from the everyday life of children and adolescents if we do not rise to the challenge (Lankinen, 2010).

Teacher education will figure crucially here. A solid command of ICT and a range of media and network environments in teaching seem to be playing an ever-greater role among the basic skills and competencies required of teachers and teacher educators. Everyone qualifying as a teacher has the right to acquire the basic knowledge and know-how needed for using media in a rich variety of ways in different subjects and to achieve a solid grasp of how ICTs can be used pedagogically when designing, implementing and assessing his or her teaching.

One piece of good news in light of recent research is that the opportunities to use ICT in the schools to support teaching and learning have improved. For some schools and teachers, the wide-ranging use of ICT and media in teaching and learning is routine. The doors of the classroom have been opened to the outside world globally, and in the process new opportunities have presented themselves to share and combine competencies and collaborate. Characteristic of schools that have succeeded in realizing the potential of ICT and making it an integral part of their teaching is that ICT and media are used in every facet of the school's work and by the entire school community. (Kankaanranta, Palonen, Kejonen, & Ärje 2011; Niemi, Kynäslahti, & Vahtivuori-Hänninen, 2012)

The challenge where equality is concerned is that substantial differences remain between schools, school levels and regions and that these gaps seem to have widened rather than shrunk (Kankaanranta *et al*., 2011; Niemi *et al*., 2012). Considerable efforts are still required before all Finnish children and teachers can be afforded equal access to the same array of learning environments and experiences.

THE NATIONAL PLAN FOR THE EDUCATIONAL USE OF ICTS: SOME PROSPECTS

Finland was quick and timely when it came to introducing ICT in teaching and learning, and the country's significant financial commitments to the endeavour made it a frontrunner internationally in the 1990s. Perhaps one of the most productive efforts on the practical level was the national strategic plan (Finland—Towards an information society, A National Outline) and the related development undertaken by the Ministry of Education and the National Board of Education in 1995. Numerous development projects were launched that could later boast successful outcomes. For example, 75% of the country's teachers took part in OPE.fi, a series of technical and pedagogical skills development programs coordinated by the Finnish National Board of Education. Then again, many of the

training programmes ended up being attended by the same core of active teachers. This trend in Finland has continued: Some teachers have solid skills and a desire to develop themselves and their work, but good ideas and applications and models for how to do things have yet to spread extensively enough throughout the school system.

International comparisons of the use of media and ICT in teaching show that today Finland falls in the middle of the pack in Europe in the educational use of ICTs (*e.g*. SITES, 2006; CICERO Learning report, 2008, European Schoolnet, 2009; OECD CERI, 2010). Many municipalities and schools have made brisk progress and some schools represent the best in the field both pedagogically and technically. Innovations and experiential pedagogical models for the educational use of ICTs do support teaching and learning, and classrooms are very well equipped.

Recent years have seen the gaps between schools and between municipalities widen. The rather autonomous way in which municipalities have developed the educational use of ICT has not always meant optimal progress nationwide. Indeed, one reason why progress has slowed in Finland is that the country lacked a clear national-level action programme. The economic investments in infrastructure have not in themselves been sufficient (Kankaanranta, 2011; see also Kozma *et al*., 2003; Law, Pelgrum & Plomp, 2008)

The new National Plan for the Educational Use of ICT was published in December 2010. The plan is the outcome of an extensive collaborative project entitled *ICTs in the Schools' Everyday Life*, coordinated by the Ministry of Transport and Communications and jointly implemented by the National Board of Education and the Ministry of Education and Culture. The project involved 20 innovative schools, 13 research units, and experts from business life and municipalities. The report presents the national objectives, as well as general strategic directions and proposed measures.

The report notes that the challenge is to disengage the schools from their present technology-oriented and superficial use of ICT. The educational use of ICT should be a natural facet of all school activities. Its use should proceed from the following considerations: 1) development of learning and mastery and learning environments, 2) support for pupil growth, 3) the needs of teachers and teaching, and 4) the needs of society and working life.

The following problems were identified at the first stage as the principal challenges facing efforts to develop the educational use of ICT in Finnish schools:

– Insufficient technical infrastructure, which varies from school to school and municipality to municipality, and unsuccessful technical solutions in the schools' learning environments.
– A lack of technical and pedagogical support (for teachers and pupils)
– Little use of innovative pedagogical models that support active engagement of the pupil, collaboration and teamwork
– The availability, quality and dissemination of digital learning materials

– Challenges posed to schools' working cultures, sense of community and capacity for collaboration
– Development of municipal school authorities, the competencies of school directors and schools' management practices, the challenge of change management and communicative competence
– A lack of partnerships between businesses and schools that are geared towards organizing schools' services
– Bringing the educational use of ICT in teaching up to date in teacher training

The Finnish national plan (2010) points out that a systemic change is required in which the educational system and the way in which schools work is revamped to correspond to the modern conception of learning. In implementing the changes, the recommendation is that existing structures be used, such as the current bases of the curriculum. Implementation of the plan and achievement of the desired results will require cooperation between the public sector in its entirety, the business community, educational providers and the schools.

The aim is for all Finnish schools to bring to bear in a stimulating way the tools and opportunities which ICT offers for supporting teaching and learning. If the schools succeed, every pupil will experience new, enabling learning environments and ways of working.

The strategic plan points out that the change will require up-to-date infrastructure and equipment in the schools. The technical solutions chosen must be of high quality and those choices must give due consideration to sustainable development. Also needed are solid technical and pedagogical support services for teachers and pupils in all schools. In developing the working culture of schools, change management and a strengthening of cooperation and a sense of community will be crucial; two means to this end are the use of co-teaching and peer coaching models. Net-based high-quality and experiential materials should be readily available and accessible to everyone. Teacher training should be developed and supported in the area of educational use of ICTs.

It is still possible to graduate as a qualified teacher in Finland without being able to use ICT innovatively in teaching or being particularly familiar with media skills. According to a report of the OECD's Centre for Educational Research and Innovation (CERI) entitled "New Millennium Learners 2010", those training to become teachers still do not acquire sufficient competence in the educational use of ICT during their studies (Meisalo *et al*., 2010). Teacher trainers have positive attitudes, but while the potential of ICT is exploited resourcefully when doing research, it is used very little in teacher training. The skills of recent teacher training graduates in Finland vary from institution to institution. In-service teachers also require constant and inclusive support in their work how to use ICTs innovatively (*e.g*. Ilomäki & Lakkala, 2011; Kankaanranta *et al*., 2011).

The national strategic plan further states that teacher training departments and other units providing training for teachers would do well to invest in up-to-date

tools that match those of the school environments in which teachers will be working. A working group of the Ministry of Education and Culture proposed that state aid be directed to the purpose in its report titled "The Information Society Development Program for Education, Training and Research 2010". It is important that pre-service teachers be able to familiarize themselves during their studies with learning environments that are part of the daily routine in the schools. Degree requirements and practice teaching should also be reviewed to ascertain whether ICT has been integrated appropriately in all degree programmes.

These kind of challenges have been in the focus of the national research project OPTEK (Educational Technology in Schools Everyday Life Research project). The project is examining and developing innovative solutions and models for the application and use of ICT and electronic media in the schools on an everyday basis. The project, financed mainly by TEKES (the Finnish Funding Agency for Technology and Innovation), was launched in January 2009 and ended up in September 2011. The first results were published in February 2011 in what was designed as a co-publication with the National Educational Technology Plan, which came out in December of 2010.

RECENT RESEARCH FINDINGS OF THE PRESENT STATE ABOUT THE EDUCATIONAL USE OF ICTS IN FINLAND

The research done in OPTEK project indicates that when ICT is used in teaching and learning, it aids in illustrating, enlivening and enriching content and in enabling distance and mobile learning. ICT can support cooperative learning, reasoning, abstract inference and visual perception. Games and simulations when used innovatively can allow pupils to practice problem-solving abilities and understanding authentic and complex phenomena. The aim in using ICT is to enhance and enrich study environments that support skills for the future alongside the physical learning environment and face-to-face interaction which pupils have in the schools. (Tella, Multisilta, Ruokamo & Smeds, 2005; Kynäslahti & Seppälä, 2004; Kangas, Sintonen & Lundvall, 2008; Vahtivuori-Hänninen *et al*., 2005; Ahonen, Vahtivuori-Hänninen & Kinnunen, (manuscript); Tuomi & Multisilta, 2011; Sairanen *et. al*., 2011; Lankinen, 2010; Kankaanranta & Vahtivuori-Hänninen, 2011; National Educational Technology Plan, 2010; Kotilainen, 2011; Vähähyyppä 2010; Rajala *et al*., 2011; Sallasmaa *et al*., 2011.)

According to a recent study, one favourable development is that principals have a more positive view of the importance of ICT in the everyday work of the school than previously. They recognize the need for change and are committed to implementing the school's shared visions and a functioning working culture in order to improve pupils' future skills. Yet there are still considerable differences in how ICT is used, although in general opportunities to use it have improved. (Kankaanranta *et al.,* 2011.)

The use of digital video technology is not difficult to pupils, and it can be learned collaboratively. Collaborative content production motivates pupils to plan, perform, film and edit. In producing content using digital video, a number of different technologies and models can be brought to bear. A study carried out at the University of Oulu observed that this affords children an opportunity to develop their 21st century citizen skills, for example teamwork and interactive skills, as well as information and media literacy. (Palmgren-Neuvonen, Kumpulainen & Vehkaperä, 2011; Kotilainen, 2011.)

Mobile social media can easily be used as tools for school projects. Over one-third of the pupils who participated in the mobile learning study felt that it was possible to learn to use a mobile video distribution service; well over one-half preferred mobile learning to traditional ways of working in school. Fun and creativity should not be suppressed; they should be encouraged. Incorporating mobile devices into teaching requires smooth operation of the technology involved as well as the appropriate training and motivating of teachers. (Tuomi & Multisilta, 2011).

A study conducted by the Media Education Research Group at the University of Helsinki observed that learning in a variety of spaces, and perhaps even at different times, promotes children's self-directedness: working in a mobile environment places an emphasis on the user's own decision-making, for using the tools, in allowing for new solutions and real-time help, enabling pupils to work using a process of trial and error. Mobility brings pupils flexibility with respect to time and location, because they study physically and virtually in different spaces. (Kotilainen, 2011; Mylläri *et al*., 2011; see also Kynäslahti & Seppälä, 2004; Koskimaa *et al*., 2007; Kynäslahti *et al*., 2008.)

All of the technology we need for educational purposes already exists. At the beginning of the 2000s, the role of ICT in teaching and learning was very much that of an add-on, something superimposed on ordinary teaching. Now that technology and media are considered an integral part of the work of the school: it has made it possible to teach less common subjects; it supports experiential learning; and it serves to reinforce cooperation between the home and the school and the partnership they form in a child's education and upbringing. School is seen as an active component of society and a place where children and adolescents learn the skills and competences that they will need not only in their future studies but also in their personal growth, everyday lives and future work. Underpinning the use of ICT in teaching are considerations of equality, a sense of community and developing a capacity for collaboration and participation. The school works within the immediate community but at the same time it is part of the global world. Using ICT in a multi-dimensional way we can bring the whole world within the reach of school pupils (see Figure 1).

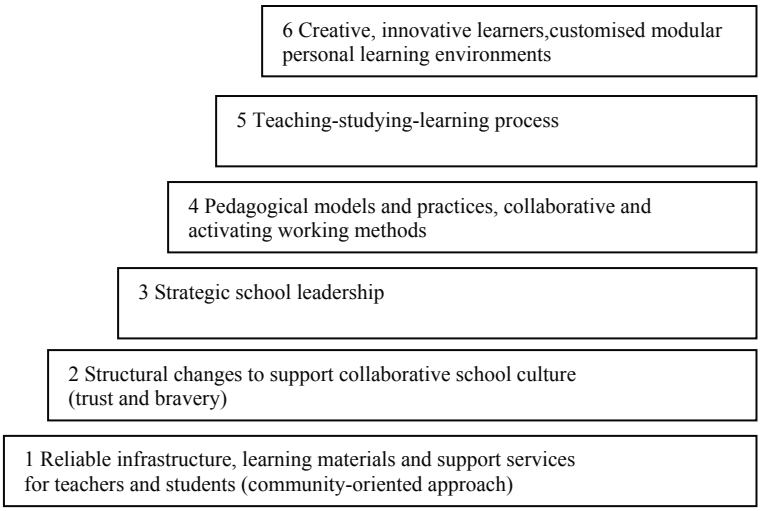

Figure 1. Towards the school of the future.

CONCLUSION

In the 1990s Finland was one of the leading information societies in the world. In order to develop Finland as a ubiquitous information society national strategies and guidelines were created. With the new millennium, the first wave of ICT projects came to an end. It seems that there has been a measure of embarrassment within the first wave countries—watching other countries rapidly develop the educational use of ICT, these first-wave countries have been sensitive, even worried, about their position in international comparisons. In Finland, we are in a situation in which we have to think again about national level strategies and governmental programmes in order to develop teaching and learning as well as the whole educational system benefiting from the use of ICT.

We have great potential for doing this. Finland has talented teachers and research-based teacher education with the know-how needed to develop the use educational use of ICT. We have now brisk national guidelines and a good opportunity to show what the new teaching, studying and learning environments and the new learning culture of the future school can be when they are at their best.

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17. PUBLIC INSTITUTIONS AS LEARNING ENVIRONMENTS IN FINLAND

ABSTRACT

The current National Core Curriculum for Basic Education in Finland defines the physical learning environment

> "the learning environment includes, in particular, the school buildings and facilities as well as the teaching tools and material. It also includes other built up surroundings as well as the nearby natural environment" (National Core Curriculum for Basic Education, 2004).

Public cultural institutions in this article are understood to be a part of the built up environment. The services provided by these are available to all citizens in Finland. These include: libraries, museums, various art institutions, theatres, music institutions and science centres. The expertise of the writers of the article is based on museums and libraries as learning environments, so the content of the article will focus on them. Finland has a broad network of public libraries and museums. The utilization of these as part of basic education has been relevant for decades. Development work has been carried out in museums, libraries as well as in the field of education. Various projects have been implemented at the state and municipal levels. In turn, individual schools and institutions have created successful local collaboration. Learning in public institutions has not been researched either in Finland or internationally to as wide extent as learning at school or other formal learning settings. However, feedback from teachers and students, evaluations and summations of projects show that studies in different learning environments, such as museums and libraries, are deemed to have a positive impact on learning. They function as learning environments, in particular as support for life-long learning.
Keywords: learning environment, public institution, museum, library, cultural heritage learning

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 249–262.
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FINLAND – THE LAND OF LIBRARIES AND MUSEUMS

According to 2010 statistics, the aged 10-14, grades from 4 to 8 in the Finnish school system, are the most frequent visitors of various types of museums and art exhibitions. Humanistic subjects such as history and art and natural sciences such as biology are the most studied subjects in museums. History studies begin on the 5th grade in the Finnish school system. The start of history studies by 5th and 6th grade students is clearly visible in the visitor statistics of the Finnish National Museum, where they are the biggest visitor group.

Table 1. The statistics of museums and libraries in Finland (Kaukonen & Vihanto, 2009; 2010; Statistics of the Public Libraries in Finland, 2011; Official Statistics of Finland, 2011).

	Museums (2009)	Libraries (2010)
Number in Finland	157 professionally run museums, with a total of 329 units open around the year A total of over 1000 units that define themselves as museum	796 main and branch libraries 154 mobile libraries (12606 stops)
Clientele per year	5,1 million visitors	53 million library visits 57 million internet visits The average number of loans 18 items/Finn/year
Number of student visitors	459375 students (museums' ways of calculation may vary)	No student-based statistics
Comparative figures	Approx. 546000 students in comprehensive school annually in Finland (grades 1-9) 342 municipalities in Finland	

Public libraries have a notable role in basic education, because school libraries have developed in a very uneven manner in Finland. Some schools have organised

their library services themselves. In the spirit of UNESCO school library manifesto (1998), The Information Strategy for Education and Research for Years 2000-2004 of the Finnish Ministry of Education prioritized school libraries as development areas (Niinikangas, 2010; The Information Strategy for Education and Research for Years 2000-2004, 1999). It has been hard for school libraries independently to meet the needs of modern information society. They have been advised to collaborate with the public libraries within their region (Kekki, Sulin & Wigell-Ryynänen, 2009).

FROM CULTIVATION TO EDUCATION

Schools and public institutions have a common social duty, which is to cultivate and educate citizens. Schools act within the scope of formal education and the latter in the informal field, which includes life-long learning. The Finnish Museum Act defines the tasks set for museums. The goal of museum operations is to promote the population's understanding and interpretation of their culture, history and environment. Museums have to provide opportunities for accessibility to information by collecting, preserving and documenting material, immaterial and visual cultural heritage in their collections for future generations. Museums are expected to work close collaboration with surrounding societies. (The Finnish Museum Act, 1992; ICOM code of Ethics, 2006).

The Finnish Library Act defines the task of libraries as follows:

> The objective of the library and information services provided by public libraries is to promote equal opportunities among citizens for personal cultivation, for literary and cultural pursuits, for continuous development of knowledge, personal skills and civic skills, for internationalization, and for lifelong learning. Library activities also aim at promoting the development of virtual and interactive network services and their educational and cultural contents (Finnish Library Act, 1998).

The Finnish Library Act does not define the relationship between public libraries and school, but it has traditionally been connected to the maintenance of citizen's literacy, influencing reading habits and encouraging general reading. Cooperation with schools over decades has mainly been field trips of student groups to the closest public library where they have been taught how to use the library, told stories, shown puppet shows and so on. With the development of the information society and with library teaching content becoming more demanding, collaboration has expanded to the realm of municipal and school-specific curricula as well as annual plans of schools.

As media have developed new dimensions have been added to basic literacy skills. The development of new literacy skills and the information society has entailed changes in the task of libraries: among other things it has started to about

teaching skills for information society and information management as well as media education. In accordance with the overall task of public libraries they are targeted at all age groups, and more often municipal libraries in Finland have started to take on the role of supporting their own regional schools (Library Strategy, 2010; Policy for Access to Knowledge and Culture, 2003).

The development of Finnish library-school collaboration has become a part of a change in social importance, self-understanding and service profiles of library branch. Through the increased complexity of social structures and technological communication and service industry, the ever more important function of libraries has changed – in addition to providing experiences and information management – bridging the digital divide, i.e. the prevention of information marginalisation. At the same time, the service idea of libraries has shifted from the providing of ready-made service products to guidance for independent information retrieval and the use of media and Internet services. Furthermore, libraries have started to train staff in new pedagogical and media skills and to view these skills as criteria when recruiting staff.

Library-school collaboration in Finland is in fact changing from class field trip-oriented assistance to the product development of libraries' pedagogical services. In modern libraries, school services are beginning to be seen as strategic foci of development. There are even deemed necessary for the future social relevance of libraries.

The Finnish Museum Act does not clearly define what museum's educational role should be. For a long time museums have been regarded as research institutions and education activities have been targeted towards higher education organizations. When museums wanted to develop the ways to open up to society and communicate their contents to the public, they first focused on school groups. The Comprehensive School Reform in the 1970's gave an impulse for discussion of museum as possible complement for basic education. At the same time, the first educational curators were appointed in Finland. In the beginning, the museum educator's main task was to guide student groups during their museum visits. Museum education activities and public services were more intentionally developed in the 1980's. The first collaboration expert group was founded by the Finnish Museums' Association and National Board of Education in 1981. The task of this group was to produce the first visions and goals for school-museum cooperation (Salo, 2010; Kinanen, 2007; Levanto & Petterson, 2004).

With the expansion of the concept of learning, museum education has taken into consideration students or visitors with special needs. Apart traditional methods (talking and writing) that use all senses have come to the museum education. Museums now cater for many public groups instead of just the public. Of these public groups, student groups are in a key role, because in this way museums reach larger age groups. Teachers as pedagogical professionals are seen as fruitful collaboration partners. In 2005, the Museum Education Association was founded to support the development of museum educators' professionalism. Currently over

one hundred members from different types of museums are responsible for a wide variety of museum education in Finland.

In Finland teachers are able to utilise different learning environments with the same independence as they can decide on teaching within their classrooms (see the articles Toom & Husu, Vitikka & al., Jyrhämä & Maaranen in this publication). The National Core Curriculum does not specify or define which public institutions students should become acquainted with during their nine years of compulsory education. Museums are referred to in six instances, libraries in 26 and the theatre in 29 instances as complements to learning in the curriculum. Teachers have been supported and encouraged to use public institutions as learning environments for formal education through several joint projects between institutions and schools. Even though the majority of Finnish comprehensive schools are public schools, schools vary in their characters. However, the will and skill to use local and national public services as part of teaching depends greatly on a school's working culture. At present there are no official Finnish statistics on how much different learning environments outside the school environment are used.

DEVELOPING BY NETWORKING

One of the most extensive networking projects has been The Finnish Oak (Suomen Tammi) between the years 1998-2008. It was a project arranged by the National Board of Education, the National Board of Antiquities and the Ministry of the Environment. The project supported the development of collaboration models between education and cultural heritage experts. The main goal in the project was to learn to know each other's expertise and to use it for cooperation. New models were searched for promoting progressive inquiry learning. This collaboration network developed the content and methods of cultural heritage education. It also developed cooperation between cultural institution workers and teachers by organizing multi-professional meetings, supplementary training and by producing literature for the field. For instance, between 2005-2008, it organised 34 educational events and 22 seminars for multi-professional groups. Also, 8 books and 3 electronic handbooks were published. In all, there were over 2500 participants: teachers, art and museum educators, environment educators and students (Järnefelt, 2009). In 2006 The Finnish Association of Cultural Heritage Education was founded to continue the project's aims. Today, the association coordinates, among other things, the national cultural education programme The Broadband of Culture - National Cultural Institutions.

The Broadband of Culture is a teaching, learning and studying programme. In it the National Cultural Institutions of Finland serve a learning environment for cultural heritage education. The programme gives material for study both history and present day activities of cultural institutions. The material is published as a book and in website form. There are also possibilities to make study trips to the institutions. Field trip gives information what the institutions do, what kind of professions are

to be found the institutions and how citizens can use their services. The Broadband of Culture assists students to understand that national cultural institutions are the property of the entire nation and everyone has right to use them. The programme serves knowledge construction in various subjects. During the first four years (2006-2009), the field trips offered by the Broadband of Culture in national cultural institutions in Helsinki involved 118 groups from 42 schools all over Finland. In addition to this many schools have used the book and material on the website.

One of the most noteworthy of all the bilateral projects between schools and museums is the Give us arts right now! (Taide meille ja heti!) – multi-cultural project in the years 2007-2009. Community Relations and Development Unit of Finnish National Gallery coordinated the project. There are projects all over Finland in which school's language and cultural groups work in partnership with cultural actors. The aim of the projects is to encourage the public to use inspirational and experimental atmosphere of the culture organisations. During these projects, there are considerations of what children and young people of different cultural backgrounds can get from cultural institutions. While at the same time assessments are made of what they themselves bring to contemporary culture and its interpretation. Cultural institutions examine the cultural diversity of their own activities and build bridges between the schools' multi-cultural realities.

Besides multi-culturalism, another challenge for contemporary schools in Finland is media education (see the article by Vahtivuori-Hänninen & Kynäslahti in the same publication). In order to support our schools in this endeavour the Finnish Library Association started up a series of projects in 2006 in which library professionals were trained in media education know-how and skills. A result of the Children, media and libraries –projects was the creation a regional educators' network in different parts of the country, material for media education and Web service for the libraries. The regional teachers of media education trained by the project teach library professionals in their own area. There are five areas of expertise to the libraries' media education programme: 1) information management and information literacy, 2) media literacy 3) digital games and gaming, 4) social media know-how and usage in libraries and 5) copyrights. Library professionals act as guides in these topics for teachers, students and students' parents (Sallmén, 2009; 2010).

The projects have striven to resolve the challenges caused by different types of learning environments. The challenge has been combining different working cultures as well as finding a common language. One big goal has been reached in many projects when the partners started to understand the opportunities offered by the others and also the possible limitations. The core of successful cooperation is always a learning organisation.

STRUCTURES AND PRACTICES IN DIFFERENT LEARNING ENVIRONMENTS

Individual projects usually provide only some teachers and students the opportunity to utilise different learning environments for a certain period of time. In order to ensure equal and continuous opportunity you need to create permanent structures and practices. The last two library strategies of the Ministry of Education and Culture have aimed to create this for libraries (Library Strategy, 2010; The Policy for Access to Knowledge and Culture; 2003; Kekki et al*.,* 2009).

Education of information management in comprehensive and upper secondary schools is to be built up by making use of the existing library network and know-how. According to this strategy, virtual, targeted school library services will be developed along side local public library service. Should these schools not have professional staff for the development of library services, the Ministry of Education and Culture recommends that the municipality arrange for the services to be provided by a pedagogical information specialist for one or several regions to use. The service could also be purchased from, for instance, a public library. This type of activity will prevent overlapping of work done by school and public libraries (Library Strategy, 2010; The Policy for Access to Knowledge and Culture, 2003).

Cultural Paths to Enrich Learning at School

Over the past five years so-called cultural paths have been developed in cooperation with education and cultural sectors at the municipal level. The goal is to offer every student in basic education one, two or three study visits to places of interest in the nearby surrounding during school year. The cultural paths make use of museums, libraries, theatres, dance, music and art institutions, sports facilities and cinemas. The basis for the cultural path activity is always the National Curriculum, but it is applied according to local circumstances and school-specific curriculum. The aim is to make a model for cultural heritage learning path for each student at the municipal level. It will be independent of individual factors such as the location, or size of the school. A programme coordinated by the education or culture sector will help teacher's work by producing instructions on the Web such as practical advice for the visit or providing material for using before and after the study visit. Some regions even coordinate transport to the places. The initiators for the cultural paths have been teachers who saw the need for coordinated cultural heritage education in schools. It would ensure equal cultural services to all local schools and students. The cultural paths strongly emphasize the connection to formal education. The starting up of cultural path activities is an aim of many municipalities or cities for the near future.

The Pedagogical Practices of Vantaa City Library

Another active model of integration of public institution and school is that used by the city of Vantaa, where the library service created its school collaboration strategy already in the year 2000. One of the goals is to strengthen and formalize cooperation by making access to library services part of the municipal and school-specific curricula. As a result of this strategy, the development of libraries' school cooperation became an executive team level responsibility. A new type of expert was recruited into the team; a pedagogical information specialist who apart from having a higher-level degree in library and information services also has pedagogical studies and experience of teaching and school activities. In 2011, Vantaa city library has two coordinating and planning pedagogical information specialists. Furthermore, each library unit has a person responsible for the region's school cooperation. Library representatives took part in drawing up the libraries' part in the new municipal curriculum for 2003-2004. At the same time, a system was created in which each library unit is responsible for education of information management and the promotion of active reading in the schools of its region. In the model this service is guaranteed at least all 1st, 4th and 7th grades in Vantaa schools. In reality, student groups from other grades also make regular visits to Vantaa libraries, or library professionals visit to teach them in their classrooms.

Strategic development has led to the productization of pedagogical services in Vantaa city library. In this way the library's role as a pedagogical actor in Vantaa's educational practices has become visible and accepted. It is also noticeable that library experts have participated in drawing up Vantaa city's reformed Education Policy Programme (to be published in 2011). The library's next school collaboration project is to study how library services can be integrated with the existing electronic learning environments in Vantaa schools.

To an individual teacher it is essential that the administrative structures support reach the targets set for teaching. In this field there is still work to do in assisting teacher flexibly utilize different learning environments. The lack of existing structures, like not exactly mentioned in the national or municipal curricula, there is no obstacle to exploit public institutions in education. In the National Core Curriculum for example libraries are mentioned as learning environments for studying mother tongue (Finnish) and literature and museums are mentioned for studying art subjects. Nevertheless, individual teachers have many opportunities to teach whatever subjects they wish in places other than classrooms. Public institutions in Finland had started to produce material and tailor-made services that support curriculum as the 1970's. A broad-minded example can be mentioned as curiosity, a study visit to The Finnish National Ballet that was integrated into physics lessons.

PUBLIC INSTITUTIONS – BOTH OBJECT AND SOURCE OF LEARNING

An individual teacher can approach public institutions from two different perspectives. First, public institutions can act as object for studying, building itself and the functions or tasks of institution for the general public. In this case the goal is to learn to know institutions that maintain Finnish cultural heritage. This is the goal for example in the municipal cultural paths as well as in the Broadband of Culture programme. Secondly, due to their content, public institutions are sources of information. These perspectives offer material for different school subjects. Public institutions can be seen equal tools for learning as books or e-learning environments.

Studying in public institutions fulfils one of general goals in the core curriculum: practicing information collecting skills and constructing knowledge from different sources. Different institutions provide different types of original information. Art, history or nature museum offers different aspects of phenomena. In addition to this libraries and archives bring their own perspective. However, all the places can have cognitive, emotional and skill-based resources. Public institutions are places in which it is encouraged learn-to-learn. They also provide good opportunities for integrated teaching. The National Board of Education encourages learning in museums and libraries because of their variation in educational methods and possibilities to provide interactivity experiences. There is an effort to combine knowledge and skills with the learner's everyday experiences. Learning environments outside classrooms are natural places for phenomena centric learning, examples of this being the authentic artefacts in museums or contact with the original sources of information with the assistance of experts. Many things that are introduced in schoolbooks are concretised in public institutions.

From the teacher perspective it is also essential that they can use the institution expertise in teaching. On the other hand, teacher's pedagogical and didactic professionalism is highly appreciated by the institutions. Learning in public institutions is best realised by utilizing several environments and by using collegial and multi-professional expertise (*e.g.* Hakkarainen, Lonka & Lipponen, 2004; Kumpulainen, Krokfors, Lipponen, Tissari, Hilppö & Rajala, 2010).

RESEARCH INTO PUBLIC INSTITUTIONS AS LEARNING ENVIRONMENTS

There is not much research either in Finland or internationally on the impact of learning in public institutions based on goals set by the national or municipal curricula. However, written and oral feedback from various projects show that

the co-operation, networking or integration of institutions and schools at different levels can have a positive impact on both institution's and school's educational work. The impact of learning has primarily been studied inside institutions and classrooms, and little work has been done on the impact these settings have on each other's effects on the process of education.

OECD's Centre for Educational Research and Innovation is working on an international publication on innovative learning environments (to be complete in 2011). It will be included reports of three different kind of learning environments in Finland. One of the reports pertains to the cultural path of the city of Kuopio in central Finland (Mikkola, Rajala, Tornberg & Kumpulainen, 2011).

One of the largest studies of learning in cultural heritage environments were made in four evaluation studies by Research Centre for Museums and Galleries (RCMG) at the University of Leicester in the years 2003-2007. The RCMG has developed the concept of Generic Learning Outcomes (GLO). Learning is examined as a process of five different areas: 1) knowledge and understanding, 2) skills, 3) attitudes and values, 4) enjoyment, inspiration, creativity and 5) activity/action, behaviour, progression. The learning outcomes that both students and teachers valued highest in the cultural environments were enjoyment, inspiration and creativity learning. The head of the study, Eilean Hooper-Greenhill PhD notes that the evaluation study has given clear indications of student's learning during museum visits. She sums it up thus:

> … that learning occurs through mind and body working together; that museum experiences both demand and generate learning: and that museums can impact powerfully on identity (Hooper-Greenhill, 2007).

Studying in different environments has an impact in particular on one's identity and metacognitive skills. This might be the reason, why it is quite a challenge to measure individual learning outputs outside classroom.

Learning in museums has been researched since the 1980's, starting in England and in the United States by, among others: Hooper-Greenhill (1994; 1995; 2007), Hein (1998), Falk and Dierking (2000) and Falk, Dierking and Foutz (2007). Nicole Gesché-Koning (2007) has compiled a bibliography of museum education literature from the year 1952 to the year 2006 within CECA. In the 2000's research work has been done internationally in Australia, Europe, South America and in the Nordic countries (e.g. Kelly, 2007; Illeris, 2006; Ljung, 2009; Insulander, 2010; Rogers, 2006).

There have been signs of interest into research concerning the complexity of formal and informal learning in Finland. One example of this is a research project funded by the Minister of Education and Culture in the years 2008-2010, titled Learning Bridges – Learning and Teaching in the Intersection of Formal and Informal Learning Environments at the University of Helsinki (Kumpulainen et al., 2010; see also Rajala, Hilppö, Kumpulainen, Tissari, Krokfors & Lipponen, 2010).

At the beginning of 2011 a five-year research project was started at the University of Helsinki teacher-training faculty called Ubiquitous School (Koulu Kaikkialla).

FUTURE PROSPECTS FOR PUBLIC INSTITUTIONS AS LEARNING ENVIRONMENTS

Finland is a small, organized and fairly homogenous country. This is why we have good prospects for bringing society into schools. Our school network and our public services are geared to be accessible to all Finns, regardless of geographic location or socio-economic background. Increasing multiculturalism and the principle of economic efficiency already pose challenges, but they are also creating new perspectives and ways to act. Both schools and public institutions are in a position where they cannot develop their services solely from their own starting point. Their resources need to be pooled. Funding systems also need to be developed in collaboration across administrative borders.

In their educational roles both schools and public institutions need to build up networks and benefit from each other's multi-professional know-how. The high level of academic education of public institution workers and both primary school and subject teachers in Finland is a good base to continue the work (see Niemi's article in this book).

The knowledge of Finnish subject teachers' of their discipline can help in the search to find a common language to use with the experts of various fields in institutions. The development of collaboration will however require teacher training in the use of public institutions, instruction in information management and updating the skills. Now and in the future, teachers need to be informed about the digital materials provided by public institutions. These materials are meant to make cultural heritage more accessible. However, digitalised material and Internet environments are not the same as real places, things and artefacts. Solutions are needed for challenges such as how to make the actual visits of large school groups more flexible and how to make schools' schedules more flexible so they can incorporate visits as a natural part of education.

The most important part of cooperation is having the same goal: to support children and young people in their individual growth and development. Public institutions as learning environments feed students interest in their cultural heritage and strengthen their identities. Training to the use different sources of information and critical thinking fosters active citizenship. The use of public institutions as learning environments in basic education encourages students to use them after the formal education has been completed. In this way, during basic education one can support the idea of life-long learning and the concept of the ubiquity of learning (Kumpulainen et al., 2010). A school is not a unit separated from society. The school is one of the agents, which should be well nurtured by different learning environments.

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18. LUMA SCIENCE EDUCATION CENTRE:

Joy of Science for All - Bringing Science, Math and Technology Together

ABSTRACT

The Finnish youth's competence in mathematics and natural sciences is top-level among the OECD countries. However, it has been found that 15-years-old youths' level of interest towards these subjects is quite low according to the PISA results. The National LUMA Centre (LUMA stands for the Finnish terms for natural sciences and mathematics) was launched in 2004 to serve as a collaborative organisation between universities, schools and business sector. One of its main goals is to support the interest towards mathematics, natural sciences and technology among children and youth on all levels of education, from early childhood education to higher education. The operational mode of LUMA Centre is based on the latest scientific knowledge on science and education. It provides a versatile selection of activities for children and youth as well as their teachers. Almost all services and events are free of charge for the participants. The content and implementation of all activities has been designed to support and maintain the interest towards the subject. At present, a research on the effectiveness of the activities is being done within LUMA Centre. Feedback has been gathered from all the activities, and accordingly the goal to guide children and youth towards the joy of learning has been reached.

AROUSING AND SUPPORT OF INTEREST

Despite the fact that Finnish high-school students perform well in science and mathematics (OECD 2010), their interest rate towards these subjects is among the lowest in the OECD countries (Arinen & Karjalainen, 2007). In order to encourage pupils and students to study natural sciences in high school and institutions of higher learning, efforts should be made to arouse and support their interest towards these subjects at the earliest possible stage. Accordingly, the main aim of the National LUMA Centre is to arouse and support this interest by different activities.

H. Niemi, A. Toom & A. Kallioniemi (Eds.), The Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools, 263–272.
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Finland needs more enthusiastic and skilled professionals in the various fields of natural sciences.

The LUMA activities have been planned and designed according to previous studies on interest and its support. Interest towards the subject has positive effects on learning (Krapp, 2002; Ainley *et al.*, 2002). Various studies state that these effects have to do with the quality and quantity of learning. Accordingly, the students' interest towards natural sciences, mathematics and technology has a significant effect on learning results (Osborne *et. al,* 2003). According to Shiefele *et al.* (1992), the effect of interest is more significant in the learning results of natural sciences than that of other subjects.

The concept of interest is defined as a phenomenon that comes up in the human interaction with one's environment (Krapp, 2002). Interest is an integral part of natural motivation, but it is not essential in all forms of motivation (Deci, 1992). Unlike other parts of motivation, interest is always targeted towards a certain matter or object (Krapp *et al*., 1992). Activities triggered by interest are pleasurable (Krapp *et al.*, 1992). If the activity is especially pleasurable, it is possible to experience flow state, during which the individual engages fully to achieve the goal. When a student is interested in something, one forms a close relationship to the subject and learning leads to in-depth learning, and the ability to apply the acquired skills and knowledge to new situations (Lavonen *et al.*, 2005).

Interest can be divided into two main branches: individual interest and situational interest created by the environment. The personal interest can be seen as stable and it is often linked to increasing knowledge and positive experiences. The situational interst is linked to a certain activity and is experienced by several people at the same time (Krapp *et al.*, 1992). Individual interest is often seen more favourable on learning results than situational interest, but arousing individual interest in a class room environment has special challenges compared to situational interest. There can be over 20 students in a class; each of them having their more or less differing individual interests, therefore catering for everyone's individual interest is demanding and time-consuming for the teacher. The alternative is a lesson that supports situational interest that acknowledges the interests of every student equally (Hidi & Andersson, 1992).

Typically, individual interest is aroused slowly but it is often long-lasting. Individual interest can be classified as latent or actualized (Hidi & Andersson, 1992). Latent interest can then be re-categorised into emotion or value-based interest. Emotion-based interest is linked to the positive feelings connected with the subject matter. Value-based interest has to do with the personal significance created by the subject. The central factors in actualized interest are the interest towards the content and will to learn for the sake of the subject itself (Schiefele, 1991).

Situational interest is aroused often quickly by an impulse created by the environment and it equally may or may not effect the arousal of long-lasting interest (Hidi & Andersson, 1992). The turn from situational interest into

individual interest requires three steps: the catch-facet of interest has to develop into hold-facet after which the level of lasting individual interest can be acquired (Krapp, 2002). For learning, it is important to maintain interest. The interest can be maintained, if the content of education is purposeful for the student's goals and values in the long run (Mitchell, 1993).

The student's interest towards natural sciences, technology and mathematics can be aroused with an active learning environment (Hidi & Renninger, 2006). The concept of learning environment is used to describe a place, facility, community, procedure or material that advances learning. Learning environment can be either a physical or a virtual space (Manninen & Pesonen, 2007). The strength of the activities in LUMA Centre lies in versatile and student-oriented learning environments.

NATIONAL LUMA CENTRE

The National LUMA Centre is an umbrella organisation coordinated by the Faculty of Science of the University of Helsinki to bring together schools, universities and the industry. The aim of the LUMA Centre is to promote the learning, studying and teaching of natural science, mathematics, computer science and technology on all levels. National LUMA Centre was established in 2004 to be part of the University of Helsinki. Collaboration between university, industry and schools has been active from the beginning of it.

The activities of LUMA Centre are governed by a steering group with representatives from all departments of the Faculty of Science. The operations are funded by the University of Helsinki and different trust funds.

Since 2010, a national LUMA council has coordinated and developed LUMA activities in Finland according to a mutual strategy. The council is in charge of national and international collaborative projects and research related to the LUMA activities. The council also decides on the funding of the collaborative projects.

The national LUMA network supports the continuity and stability of LUMA Centres in different parts of Finland, and helps them in networking (Strategy 2010). It enables the communication between different partners and gives an opportunity to share good procedures. The network supports the integration of teacher education into LUMA activities and promotes research and research-based teaching.

The goal of the national LUMA network is to promote learning, studying, teaching, and teacher education in natural sciences, mathematics, and information technology. In addition, the network promotes the design and launch of new teaching methods, technologies, and learning environments. The network actively supports the teachers and student counsellors in matters related to teaching and studying of so-called LUMA subjects. The network advances the studying of these subjects by motivating pupils and students. One of the objects is also media

visibility. The aim is to increase the knowledge of the significance of these subjects among decision-makers and wider audiences.

The national LUMA network consists of National LUMA Centre, operating within the University of Helsinki, and five regional LUMA Centres operating within the University of Oulu, University of Eastern Finland, University of Jyväskylä, University of Tampere and Tampere University of Technology, and University of Turku. The Swedish-language Resurscenter RC operates within Åbo Akademi. In addition to aforementioned institutes of higher learning, the LUMA council has also representatives from Finnish National Board of Education, industry, pedagogical organisations and The Finnish Science Centre Heureka. LUMA network collaborates with all parties interested in the teaching of LUMA subjects. The National LUMA Centre coordinates all operations within the LUMA network. The leader of National LUMA Centre is also the chair of the whole LUMA network and the coordinator of LUMA Centre is the secretary of the network.

LUMA Centre Supports Teaching, Learning and Interest

The goal of LUMA Centre is to support the learning and teaching on natural sciences, mathematics, and ICT and technology on all levels of education, from pre-school education to higher education. In the centre of all activities is the aim to arouse and support the children and youth's interest towards these LUMA subjects. The teacher's role is extremely important in developing a positive attitude towards natural sciences and mathematics in children and youth. Therefore LUMA Centre puts emphasis on the lifelong learning of teachers. The base for the lifelong learning is created already during the training of pre-service teachers. The LUMA activities have been integrated into the training of subject teachers. LUMA Centre also provides in-service training for teachers. There are also possibilities for networking and self-development through LUMA Centre's online services.

The teacher education is strongly integrated into the operations of LUMA Centre. The collaboration is especially active in three Faculties of the University of Helsinki – Science, Biological and Environmental Science and Behavioral Sciences. The vast and versatile library services, material banks, and online services help teachers already on pre-service stage to find materials and resources to support their prospective careers. The pre-service subject teachers have an active role in producing teaching materials and ideas to benefit all teachers of LUMA subjects in Finland based on the latest research information.

During the whole of their studies, LUMA Centre provides the pre-service teachers of natural sciences and mathematics with an excellent opportunity to practice interaction with pupils and students. LUMA Centre arranges science clubs, camps and classes for children and youth the year round. The guides of these activities are pre-service teachers. Authentic experiences of regular sessions with

student and pupil groups are valuable in acquiring skills to guide and direct groups of children and youth.

The foundation of LUMA Centre is formed by the subject-specific resource centres in the Faculties Science, Biological and Environmental Science, and Behavioral Sciences. LUMA Centre has separate resource centres in mathematics, biology, physics, chemistry, geography, pedagogy, and computer science. The strengths of these resource centres are in the latest research information, and developing research-based activities and materials. The resource centres within the LUMA Centre collaborate on an interdisciplinary level; different phenomena can be studied without getting stuck in only one perspective. Phenomena-based contextual learning can be used to support students' interest (Pilot & Boulte, 2006).

LUMA Centre's Science Classes – New Learning Environments to Support Children, Youth and Teachers

LUMA Centre supports pre- and in-service teachers as well as the children and youth's interest towards natural sciences and mathematics in active science classes. The science classes provide the teachers with an opportunity to bring their pupils and students to conduct laboratory experiments and activities in the authentic facilities of Kumpula science campus. Science classes can also be used to organise in-service training for teachers, and they also support subject teacher training by providing the pre-service teachers with the possibility to practice instructing activities for visiting groups. LUMA Centre's science classes include ChemistryLab Gadolin (http://www.kemianluokka.fi/english), opened in 2008, F2k Laboratory (per.physics.helsinki.fi/f2k/F2k-laboratorio.html) for physics, which was opened in December 2010, and Origo class for mathematics (wiki.helsinki.fi/display/Summamutikka/Matematiikkaluokka+Origo), opened in March 2011.

All activities in science classes are free of charge for the visitors. Thus, each school in the region has an equal opportunity to participate in the activities.

Versatile Learning Environments of ChemistryLab Gadolin in Supporting Learning and Interest

ChemistryLab Gadolin is an active learning environment that offers versatile services for schools and educational institutes in all levels. Its main function is to offer active study visits for student groups with possibilities to do experimental chemistry in an authentic university laboratory, and familiarize themselves with the possibilities of molecular modelling with computers, meet scientists and visit their laboratories, and get information on the field of chemistry, and possibilities to study it. ChemistryLab Gadolin is open for children and youth of all ages, and the content of visit is planned with each group, according to their individual educational goals.

ChemistryLab Gadolin's goal is to support the learning and teaching of chemistry and increase interest towards the subject, and raise awareness of the vast possibilities in the field of chemistry, provide information on education possibilities and careers and give positive experiences of chemistry education. ChemistyLad Gadolin operates in close collaboration with different parties. The University of Helsinki, industries, schools, and educational institutes work together to reach the mutual goal. ChemistryLab Gadolin was named after a Finnish chemist Johan Gadolin (1760–1852). The educational goals of ChemistryLab Gadolin are based on the core of the National Curriculum (www.oph.fi/koulutus_ja_tutkinnot), supporting the content of chemistry lessons on different levels with the latest research information on chemistry learning and teaching to increase know-how on chemistry, and develop chemical education.

The aim is to support relevant and sensible teaching, learning and studying of chemistry in different groups of pupils, students, teachers and collaborative partners. By creating positive learning experiences, chemistry is promoted in positive and versatile ways, and the image of chemistry is made more appealing. To reach these goals, the workshops for all visits are tailored according to the group's needs. Several laboratory and modelling workshops are designed individually to suit each visitor group. The aim is that the activities combine the up-to-date research, versatile applications of chemistry and their importance to the infrastructure, and information on career options in the field of chemistry.

Different learning environments meet in ChemistryLab Gadolin. Learning takes place in authentic facilities of the university. In addition to actual learning environment, Gadolin also offers virtual learning environment. Computer-based modelling and animation programmes visualize the micro level chemistry in a meaningful way and the web-based learning platforms support learning. Meeting scientists and interacting with them is one example of the social side of the learning environments ChemistryLab Gadolin offers.

Webzines as Virtual Learning Environments

LUMA Centre publishes four webzines of which Jippo is for 7 to 12-year-olds and Luova for 13 to 19-year-olds. The target audience of English-language MyScience consists of young people around the world, who are interested in natural sciences and technology. The newest webzine, LUMA Sanomat, is for teachers. The webzines are directed by an editorial council.

The aim of the webzines is to support teaching and learning of LUMA subjects, and provide activities. They function as interactive forums where children, youth, and their teachers can communicate and get their own articles and ideas published. The social environment within the webzines encourages the readers to engage in natural sciences and mathematics.

Over the years, the webzines have reached thousands of children, youth, and teachers. Jippo has had ca. 35000 individual visitors per year, the numbers for

Luova and MyScience are 73000 and 15000 respectively. In the webzines targeted for children and youth, the most popular content is formed by try-this-at-home scientific experiments and tasks that are published on weekly basis. The interactivity can be seen in answers and comments on each website, and online discussions induced by the topics.

Jippo science webzine supports elementary school teachers by providing them with material for scientific and mathematical tasks and experiments every week. These tasks have been designed based on the National Curriculum (2004). Instructions for the tasks and experiments have been downloaded over 200 000 times.

Webzine LUMA Sanomat (LUMA News) was launched in October 2010, and it is targeted for the teachers of natural sciences and mathematics on all levels of education. The interactive level of LUMA Sanomat has increased lately, which can be seen in active discussions on topics. In addition to research-based teaching material that is published in LUMA News, teachers themselves can share educational multimedia contents to each other. The latest research information on natural sciences and mathematics as well as information on studying and career possibilities in the field are in the focus of LUMA Sanomat. Students are more interested in studying, when they grasp its importance in their every day life (Gilbert, 2006). When the teacher has knowledge of the possibilities of new technology, and information on the studying and career possibilities of different subjects, it is possible to better address the problem with the lack of interest among the Finnish youth.

Camps and Clubs – Interdisciplinary Learning Environments for Children and Youth

Science camps and clubs are informal learning environments. Informal learning environment refers to all learning environments outside the school environment, i.e. libraries, museums, meetings with specialists, camps, and clubs. Activities in informal learning environments can be used to increase interest towards natural sciences and mathematics among children and youth (National Research Council U.S., 2009).

From the start, LUMA Centre has organized popular after school clubs and summertime camps. The clubs are aimed for children and youth of 7 to 15 years of age. These clubs are organized in school or university premises, and one session is held typically once every six weeks lasting 1 to 1.5 hours each time. The clubs are free of charge for children and they are guided by subject teacher students. Contents are based on the latest research information and the clubs are designed to support the basis of the National Curriculum (2004). The approach to content is often made innovative and interesting to the children and youth by means that

studies have shown to be effective, e.g. information and communication technology (Lavonen, 2008).

LUMA Centre also arranges free club gatherings for the youth. The aim of these science clubs is to present the latest research information on natural sciences and mathematics, support interest in these subjects, and give information on studying and career options and arrange opportunities to network with like-minded peers.

Information and communication technology is strongly visible in LUMA activities for children and youth. Using different computer-based visualizing and animation tools is common during the clubs and camps. The participants of science camps have also told about their experiences in Jippo webzine's camp blog. Virtual learning platforms are also used in some of the activities, for example in pondering different tasks before the science camp.

The activities in LUMA Centre's camps and clubs provide interdisciplinary approaches to natural sciences, technology, and other subjects as well. These approaches include mathematics of art and chemistry in cooking. LUMA Centre has long traditions in linking different public spheres and museums to the teaching of science and mathematics. In 2008, LUMA Centre published a series of concrete ideas to link museums and art and cultural education to natural sciences, mathematics, and technology. The series was published in LUMA Centre's news that was spread via email to teachers.

MY Camp – International Science Camp for Youth

Millennium Youth Camp, held for the first time in 2010, is a science camp for young people, who are talented in natural sciences, mathematics, and technology. LUMA Centre is one of the main organizers of the camp together with Technology Academy Finland, and Centre for School Clubs.

Every year, 30 talented young people around the world are chosen to participate in the international camp according to 2-stage application process. This year, there were over 1400 applicants from 100 countries. The goal of the camp is to encourage 16 to 19-year-olds to study natural sciences, mathematics, and technology. Another aim is to give information on the studying possibilities and career options in Finland and at the same time promote the Millennium Technology Prize. The camp offers the youth the possibility to network with like-minded people and enjoy the feeling of togetherness, and experience the Finnish nature.

FINAL WORDS

LUMA Centre has established many activities and events targeted to children, youth, and their teachers since 2004. The activities of regional LUMA Centres' cover the whole of Finland. The webzines reach a number of those interested in natural sciences and mathematics nationally and internationally. LUMA Centres

efforts to increase interest and joy of learning have paid off. This can be seen in the popularity of different forms of activities and in gathered written feedback. In the future, LUMA Centre will focus is operations particularly in the research of operational models that have been noticed to be effective. The functionality of science classes is already being studied, and a broad research on clubs and camps will be conducted later. Also, the effects of LUMA activities on the lasting interest towards natural sciences and mathematics among children and youth will be mapped. The operational mode of LUMA Centre is constantly being developed according to the latest research information in order for it to support the children and youth's interest towards natural sciences, technology and mathematics in the best possible way.

The aim of LUMA Centre is to answer the challenges of constantly evolving information society: teacher has to stay up-to-date with the latest applications of the classroom technology and find best ways to use them to support teaching. To achieve this, LUMA Centre has invested in high quality in-service education and teaching materials in which information and communication technology have a significant role in supporting the lifelong learning of teachers. In the future, a variety of videos, simulations and animations suitable to teaching will be produced and published in LUMA Centre's webzines.

LUMA Centre will constantly develop its functions towards ensuring the joy of learning and achievement in children and youth, because they are the future.

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EPILOGUE:

How to Be Prepared to Face the Future?

The best way to ensure a high quality of education is an urgent topic in most countries. Learning and education have been typical concepts found in the educational sciences and psychology for decades. Now they are more and more political concepts. A high quality of education is seen in many forums as a key factor for national economy, global competiveness, and the welfare of society. The OECD has also highlighted in discussions how high qualities of education and health are related and how active citizenship is liked to education (OEDC 2010). The message from the OECD' s researchers is "The evidence to date suggests that features of the educational experience may be very important in the formation or destruction of personal resilience and that this resilience is an important element in the capability of individuals to achieve good health outcomes or manage ill-health."

UNESCO (2004) claims that access to good-quality education as a human right and supports a rights-based approach to all educational activities (Pigozzi, 2004). The UNESCO report (2004, p. 30) advocates:

> "Although opinions about quality in education are by no means unified, at the level of international debate and action three principles tend to be broadly shared. They can be summarized as the need for more relevance, for greater equity of access and outcome and for proper observance of individual rights. In much current international thinking, these principles guide and inform educational content and processes"

The European Union has published numerous documents and declarations on the importance of high quality learning and has the emphasized the key role teachers play in this (Commission of the European Communities, 2007). The European Commission published 2010 the document "Improving Teacher Quality: the EU agenda" that summarizes the priorities for improving Teacher Education that were defined by Ministers of Education in the Council Conclusions of November 2007, 2008 and 2009. It emphasizes teachers' activities as high quality professionals and school leaders as key aspects of Europe's strong pedagogical mission.

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The Finnish educational system has been successful when measured using almost any type of indicator. Investments have been at a moderate level but they have produced excellent outcomes when compared to investment made in many other countries. This book has introduced educational policy and practice in schools as well as teacher education. The articles have described what has been done so far. The big question is how Finish society and education can keep high quality learning in schools and also have excellent and committed teachers in the future. The system has been developed over the last 35 years, and Finnish society has changed very much from those early years when the national comprehensive school system with its strong emphasis on equity was conceived and implemented.

As a conclusion to the articles in the book, we are looking at the main challenges the Finnish educational system will face in the coming years. We will reflect on them from three specific perspectives: (1) How to promote a common and equal society through education; (2) how to use evaluations as tools for educational improvements; and (3) how to support life long learning in teaching professionals.

A COMMON AND EQUAL SOCIETY THROUGH EDUCATION

The concepts *equal* and *equity* are often used with the following meanings: Equal refers to an ideal and aim that people should have the same rights as each other without considerations of their sex, status or race. Equity is a policy-making concept that embodies the quality of being fair and reasonable in a way that gives equal treatment to everyone. The Finnish educational policy has aimed to operate under an umbrella that encompasses both meanings. The educational policy has systematically reinforced practices that provide equal opportunities for different learners.

In the future, Finnish society will face several challenges related to ensuring current high quality learning opportunities for all learners as Finland becomes a multicultural society. It is important to ensure that everyone will have equal opportunities for education and learning. Aspects related to multicultural education, for example mother tongue teaching, religious education and location of multicultural pupils in all the schools in a city, are continuously considered in Finnish educational decision-making.

Another threat is the diversity in the provision of education, by the municipalities who have responsible for the quality of education at the local level. There are big differences in their financial bearing capacity, and this has clear consequences for educational services. Diversity and different learners have to be taken into account by identifying and supporting them at the early stages of their difficulties. Important tools are organizing special needs education at local schools and classrooms, and offering multi-professional support through pupil welfare groups (consisting of a principal, special education teacher, school psychologist, school

nurse and school social worker) in schools. Finnish schools subscribe to an inclusive policy for organizing special needs education. The aim is to organize support for all learners –not by making problem students repeat classes, but by keeping all the youngsters with their peers as they progress through the educational system.

EVALUATIONS FOR IMPROVEMENTS

The Finnish evaluation policy has been enhancement led, which means that evaluation is a tool for improvements. We have used summative and formative evaluation modes and techniques to obtain feedback and information about effectiveness of teacher education, learning outcomes of schools and the well being of teachers. We do not have standardized achievement testing, value added teacher scoring based on student progress, an inspectorate or teachers' probation time. The whole system is based on the idea of teachers as high quality professionals and trust in their work. This is totally opposite approach to that used in any other country. A consequence of this policy is that the teaching profession is very popular and one of the most attractive academic programmes in universities (VAKAVA Statistics, 2010; 2011).

Finland wants to promote evidence-based educational policies and practices. We participate in international comparative measurements, for example PISA, AHELO, TIMSS, and SITE. Policy-makers and practitioners need valid and relevant scientific research as well as other evidence sources on which their decision-making can be based. Evidence is also created by practitioners; through their reflection and sharing of experiences. They need open and analytical minds to produce valid outcomes and communities, which support their knowledge creation. Educational situations and decisions are always very complex phenomena and the data from these situations should also be gathered from multidisciplinary and multi-professional perspectives.

> "For decades, the Finnish orientation toward teacher education has been to the development of a research-based professional culture. 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 analyze 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 the educational field, be able to search independently for information and data related to the problem, elaborate on them in the context of recent research in the area, and synthesize the results in the form of a written thesis. They learn to study actively and to

> internalize the attitude of researchers as they do their work. (Niemi & Jakku-Sihvonen, 2006, pp. 36–37.)

In order to achieve these goals, the Finnish principals and trainers should have the competence to use, produce and assess evidence from their work. These abilities should be guaranteed in their professional education and in-service training. Teachers need evidence in order to promote student learning, principals need the latest research and best evidence for long-term strategic planning for their schools and in order to fulfil their role as pedagogical leaders. Principals are responsible for creating suitable working conditions for teachers and empowering them to work as high-level professionals. The aim is that teachers should be able to internalize a research-orientated attitude towards their work. This means that teachers should take an analytical and open-minded approach to their work, that they should be able to draw conclusions based on their observations and experiences and develop teaching and learning environments in a systematic way.

SUPPORTING THE LIFE-LONG LEARNING OF TEACHERS

Although Finnish teachers are seen as high –quality professionals and their research-based MA-level teacher education gives them tools for professional development throughout their career, they still need support for their work and various possibilities for in-service teacher education. Teachers need to develop their knowledge of subjects and teaching methods as well as teaching materials and equipment in order to teach effectively and support the learning processes of their pupils. Teachers also benefit from in-service education related e.g. to learning difficulties, curriculum processes, multicultural education, and pedagogical leadership at schools. The range of both topics and methods in professional development courses should be wide and innovative. Technology-enhanced in-service teacher education in the form of collaborative learning process with teaching peers would provide several competencies for teachers at the same time (*cf*. Darling-Hammond & McLaughlin, 1995). The topics and methods should also be generated from the direction of teachers, not only top-down from ministries and departments of education. In-service teacher education should offer such knowledge and skills that would be directly transferable to classroom work with pupils (Lipponen & Kumpulainen, 2010; Lortie, 1975/2002).

In Finland, we do not have a comprehensive in-service teacher education system for teachers, but rather we have many institutions, like open universities, centres for continuing education, folk high schools, teacher trade organizations and unions etc. that organize courses and further education for teachers. Finnish teachers participate very actively in these and are really enthusiastic to develop their professional capacities. Teachers also educate themselves professionally by participating in various pedagogical development and research projects organized by university researchers, the National Board of Education, or the Ministry of

Education and Culture and local schools. These are often very fruitful collaborators for all the participants. There are also a number of Finnish teachers, who apply to universities to carry out doctoral studies in education or in subject related pedagogy. Typically they are interested investigating in some specific topic from their everyday teacher work and, thus, strive towards a PhD degree (Toom & Pyhältö, 2010; 2011). They use doctoral studies as an academically emphasized route of in-service teacher education. After gaining a doctoral degree, the teachers may move to educational expert tasks, but many of them also stay in schools and continue their work as teachers. The future aim is to build a personal continuum to all teachers that cover all the phases: pre-service TE, induction and mentoring of new teachers and inservice training.

CONCLUDING THOUGHTS: THE IMPORTANCE OF SOCIAL COHESION

One feature in western societies is the breaking down of social security. Social networks no longer give citizens the same feeling of security. People feel isolated in western societies and are not as active as citizens. The challenges that arise from the changing structure of society are major source of problems for many societies in our times. In many societies there are citizens who don't share any common thoughts; the ideological dimension of society is very heterogeneous. People do not have common values and their conceptions of democracy, welfare and citizen tasks are very different. In changing situations social cohesion has been pointed out as one key factor that should be rediscovered. But we should also reflect on new interpretations of social cohesion. Wickham (2003) emphasizes the importance of 'social cohesion' and distinguishes between its vertical and horizontal aspects. By vertical aspects, he means inequalities of income, wealth and power. By horizontal social cohesion, he means a sense of mutual trust and responsibility between members of society. (Wickham 2003, p. 103). In Finnish society it is very important to develop ways in which social cohesion between citizens can be raised. Schools are central to this development. School should be opened to all members of society. Schools could also serve as places where people of different backgrounds meet each other. Nowadays, in Finnish schools there are lots of different activities that bring people together and give them a sense of social cohesion. For example many schools organize co-operation between the schools, parents, other educational partners and stakeholders. According to old saying, the entire community should be involved in educating a child. Social cohesion is a vital part of education.

The main features of Finnish pedagogy are nowadays: 1. The expansion of learning environments: Nowadays, learning also occurs in other places than normal school classes. 2. Active participation in learning: Learners are nowadays active in their learning processes. 3. Pedagogy has shifted to a more study-based approach in which participation is one key element. 4. Learning is not anymore based only on teachers' activities, nowadays many forms of learning happen in real life situations

e.g. in libraries, museums, streets and networks (Kumpulainen et al., 2010). The new places, positions and ideas of learning require much more co-operation and social connections between learners. Learning in different places can be a very important factor for improving social cohesion.

The Finnish Ministry of Education and Culture places emphasis on the fact that the welfare of society is based on education, culture and knowledge: The meaning of education in Finnish society is huge. Finnish society tries to take every opportunity to develop every aspect of society as a learning society. This means that society emphasizes that all citizens should get an opportunity to direct themselves to the bridges of learning. The educational sector in Finnish society continuously strives to develop different ways in which different learners can improve their potential to learn. Teacher education is a key element for changing society towards a learning society. In Finnish society we will keep teacher education at a very high-level, because we realize how educating new teachers impacts society. The social cohesion of students is emphasized in teacher education: they have usually a lot of group work, pair works and co-operative tasks in their education.

The Finnish school system has developed in strict connection with Finnish society. Many values and ideals of society were first developed in schools. The equality of citizens despite their parents or parents' economical status is one of the leading ideas of Finnish schools. Schools should improve children's maximum capacity for learning and furthermore, give them the joy of learning together in a multidimensional society.

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