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The Fourth Science of Education

Early childhood education as a discipline in the curricula of Finnish universities

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Abstract: Early Childhood Education has been a multidisciplinary field and focus of research. The academization of kindergarten teacher training and the emergence of a professorship in the mid 1990s, however, signified a shift in the development of Early Childhood Education (ECE). Early Childhood Education began to develop as a sub-discipline within educational sciences. Due to the autonomous nature of Finnish universities it is possible to emphasize the contents of the teaching and the study within each discipline as desired. Along with the introduction of university level kindergarten teacher education, universities have had to define Early Childhood Education and its status as a new discipline. When clarifying the structural foundation of Early Childhood Education, we have also have to consider how General Education or Education, especially Early Childhood Education as a Main Discipline, meets the challenges of scientific study and the changing field of Early Childhood Education. On the basis of our analysis there are two conflicting developments in the curricula: 1) ECE is one sub-field of General Education, 2) ECE is the fourth educational science among other sciences of Education. And already in one Finnish university ECE is like anomaly, defined as Main Discipline.

INTRODUCTION

The academic history of Education in Finland does not primarily rest on the high standard of research in Education, but is mainly the result of school development and the success of the school institution. Comprehensive school reform and the establishment of teacher training colleges at universities have contributed to the establishment of professorships in Education and to the definition of the sub-fields within Education as well. A significant number of professorships have been established specifically for the needs of teacher training and for various subject didactic studies (Rinne, 1997; Rinne & Kivirauma, 1997; Simola, Kivinen & Rinne, 1997.) As Ivor F. Goodson (1995) has described, a new subject often brings about the creation of a university base for the 'discipline' so that teachers of the subject can be trained.

The academization of Early Childhood Education as an educational science is related to the expansion of day care, the development of pre-school education for 6-year-olds, and the inclusion of kindergarten teacher education as a university field of study. Early Childhood Education has been a multidisciplinary research subject since the early 1970s, when psychologists began to show an interest in the questions related to the newly established day care institution in Finland. It was not until the launching of university level kindergarten teacher training and the emergence of a professorship and research posts, however, that an academic infrastructure was created for Early Childhood Education, thus creating an entirely new situation in the history of education sciences. Along with the statutory changes, former college level Early Childhood Education began to develop as a sub-field of the educational sciences (Husa & Kinos, 2001; Karila, Kinos, Niiranen & Virtanen, 2005; Kinos, 2004).

Consequently, the history of Finnish Education is closely connected to the teacher education. From its beginnings as an auxiliary science

in secondary school teacher and primary school teacher education, Education has evolved into a Main Discipline and a core science in the teacher training units of universities (Rinne, Jauhiainen, Kivirauma & Pennanen, 1998). The evolution of Early Childhood Education has shown a similar development. Whether this development will reflect and emulate that of Education remains to be seen.

Finnish universities, however, functions as autonomous institutions, and thus have the possibility to direct and emphasize the contents of the teaching and the study within the disciplines as much as desired. Universities offer academic kindergarten teacher education and have placed Early Childhood Education in the task field in a variety of ways. Burton Clark (1993) has indeed aptly stated that national university systems will become even more complex and that this constant structural differentiation is a guarantee of vital continuity. And diversification has become a fundamental trend.

A two-level degree structure related to the Bologna Process was established in 2005. When preparing a reform and clarifying the structural foundation of Early Childhood Education, the ability of General Education or Education, and Early Childhood Education in particular, to meet the manifold vocational and social challenges in field of scientific study and the field of Early Childhood Education must be considered (see also Fritzell, 2006; Wood, 2004). In a written question in the Finnish Parliament regarding the position of Early Childhood Education as an academic subject and discipline, it was proposed that General Education has not provided a sufficient scientific foundation to develop the field. In his answer to the question, the Minister of Education referred to the autonomy of universities and to the possibilities to arrange the teaching and the study in the way considered by it to be in accordance with the purpose (KK129/ 2004 vp).

In this article, which is a part of the research project *The Formation of Early Childhood Education in the Curricula of Finnish Universities*[1], empirical material consists of the curricula of the candidate education in 8 kindergarten teacher training units in the years 1995–2006. The examination focuses on the Main Discipline in the degree and its structure and content. Recent reforms in the training have been dramatic in regard to the structures and contents; in other Nordic countries, this has also been the subject of dynamic research (e.g. Johansson, 2006). In Finnish research the discussion concerning the reformed curricula of Education, the training of Early Childhood Education and its curricula has currently been postponed (Jakku-Sihvonen, 2007; Simola, 1997; cf. Johansson, 2006).

A PARADIGM SHIFT IN EDUCATION: THREE EDUCATIONAL SCIENCES

The question of what constitutes 'scientific' educational research has gained considerable attention in recent years. Its rise to prominence has been motivated by the view that serious attention to rendering educational research truly scientific is required if it is to contribute to improved educational practices and outcomes (Howe, 2005, cf. Säfström, 1996). Recently, it has been customary to divide Education in Finland into three separate sciences: (1) General Education, (2) Adult Education (science) and (3) Special Education. General Education was initially founded in 1852, based on the discipline of Pedagogy and Didactics which had received a professorship by this time. The roots of Adult Education lie in folk education (1946). Special Education has developed from 'Protection' education which received its chair in 1948. Following this development, General Education, Adult Education, and Special Education have each taken individual directions in examining their specific field of research, framing their questions, and research methods and targets (Rinne, Kivirauma & Lehtinen, 2005).

An attempt has also been made to question the concept of three educations by critically examining the perspectives that justify the existence of an autonomous science. In this context, questions have been raised about whether and how the aforementioned three sciences have actually contributed to the study of people's growth and development and the interconnections of a developement and education with their differing arrangements, concepts, and research methods. It has also been questioned whether these three educational sciences have, independent of each other, produced unique, incongruous interpretations and explanations of the phenomena in development and education (Nieminen, 2000; Peltonen, 2005; cf. Fritzell, 2006; McCulloch, 2002; see also Tibble, 1971).

The development of Education in kindergarten teacher training has taken place slowly but surely. In Table 1, the transformation of peda-

gogical studies is presented in relation to the institutional historical stages of kindergarten teacher training. Table 1 shows the development of Education from an auxiliary science in kindergarten teacher training to a Main Discipline and a core science in kindergarten teacher training units of universities (cf. Rinne et al, 1998).

Table 1. Changes of the studies in Education in the kindergarten teacher education in Finland

Year	*Institutional historical phase and its characterization*	*Studies in Education*
1892	Uniform training: Kindergarten teacher institutes (seminars)	Courses in Pedagogy and Didactics
1973	Division into two forms of training: Kindergarten teacher institutes and temporary training in universities	Basic studies in Education
1995	Unified training at universities	Basic and subject studies in Education, especially in Early Childhood Education
2005	Internal differentiation of training	Basic and subject studies in: Education Education, especially in Early Childhood Education Early Childhood Education Science

In the official legislation of pedagogical degrees (576/1995), the Main Discipline of kindergarten teacher training was Education, especially Early Childhood Education. In 2005, the Ministry of Education released a new decree (No. 568/2005) on the educational responsibilities of universities. The Main Discipline in the training is currently Education, except at the University of Jyväskylä, where the Main Discipline for both a Bachelor's degree and a Master of Arts degree is Early Childhood Education Science. Thus we can see two conflicting developments and the beginning of the newest paradigm shift or scientific revolution in the "normal science of education" from Kuhn's perspective (Kuhn, 1969), in the shaping of the academic Early Childhood Education since 1995:

1) Early Childhood Education is one sub-field of Education (Education, especially Early Childhood Education) or 2) Early Childhood Education Science is the fourth education science along with General Education, Adult Education, and Special Education.

However, the roots of Early Childhood Education science can always be traced to the mid-1970's when the first professorship of Early Childhood Education was established in Finland at the University of Joensuu. This professorship was the only professorship in the field in Finland for 20 years (Husa & Kinos, 2001).

RESEARCH AIM AND METHODOLOGY

The aim of this study is examine the shifting paradigm and the historical development in the light of higher education curricula (Kivinen & Rinne, 1995; Simola, Kivinen & Rinne, 1997; see also Kuhn, 1969/1962). In this article, the academization of Early Childhood Education is examined as the first decade of regular university level Early Childhood Education, from being permanently established in 1995, until its predominance as a result of the Bologna Process in 2005. In our earlier analysis, we have discovered that curricula find their form and content only gradually, adhering to a number of historical developments. Thus, the year 1998–1999 was chosen as the first sample year of academization: By this time the resulting reforms brought along by academization were already established in the curricula of universities. Due to the time limitation, our second sample year is the year 2005–2006[2], in other words the last curriculum of the decade before the actual establishment of the curricula in accordance with the Bologna Process.

By examining the curricula of academic kindergarten teacher training, our aim is to find empirically justifiable answers to the following questions:

- What kind of shifts have taken place during the time examined in the educational main studies of kindergarten teacher education since 1995 to 2006?
- How has the position of General Education as a Main Discipline changed in the curricula?
- How have the studies in Main Discipline been emphasised both in content and structure?

The analysis focused on the curricula of kindergarten teacher training, examining the study modules of the Main Discipline, the objectives of the courses, the content descriptions, the required reading, and the credits for each course. Attention was thus paid both to quality and quantity. The studies in the different universities can be divided into four main categories:

- Studies of the General Education[3],
- Research studies[4]
- Studies of the Early Childhood Education[5]
- Practice[6]

In our study, we utilize both qualitative and quantitative content analysis and the interaction between qualitative and quantitative content analysis (Ercikan & Roth, 2006). The analysis begun with a qualitative analysis of the contents, the purpose of which was to classify the Main Discipline studies into content categories. Research analysis was conducted independently. The results of the analysis were then compared. Particular attention was paid to the sections where the researchers' results and interpretations differed. Any unclear sections were discussed to find a mutual interpretation. The qualitative analysis created the foundation for the quantitative analysis and comparison. The present article presents primarily the quantitative results.

Table 2. The Main Discipline in the curricula, years 1998–1999 and 2005–2006

University	*1998–1999*	*2005–2006*
Helsinki	Education	Education
Joensuu/Savonlinna	Education, especially Early childhood education	Education, especially Early Childhood Education
Jyväskylä	Education, especially Early Childhood Education	Early Childhood Education Science
Oulu	Education, especially Early Childhood Education	Education, especially Early Childhood Education
Oulu/Kajaani	Education	Education
Tampere	Education	Education, especially Early Childhood Education
Turku/Rauma	Education	Education
Åbo Akademi/Pietarsaari	Education, especially Early Childhood Education	Education, especially Early Childhood Education

RESULTS

Main Discipline in kindergarten teacher training

For kindergarten teacher training, the total scope of a Bachelor of Arts degree in Education was defined as 120 credits according to relevant legislation in 1995–2005[7]. The degree had five areas:

- General studies (usually language and communication studies)
- Education, especially Early Childhood Education
- Studies that provide vocational readiness[8]
- Studies of the minor subjects
- Optional studies

Education, more specifically Early Childhood Education, has been an established Main Discipline since 1995. In spite of this, Education has been the Main Discipline (see Table 2, above) in the curricula of several universities (Helsinki, Kajaani, Tampere, and Turku). As an academic subject, the Main Discipline has been shaped in two ways: Via administrative and legislative decisions (Ministry of Education and Parliament), and via differentiated university based curricular solutions, i.e. independent choices and the reorientation of substance, based on the autonomy of universities. As can be seen here, the official decree on university degrees has played a key role in determining the structure and content of these degrees.

Content distribution in educational Main Studies

During the year 1998–1999, basic pedagogical studies and subject studies included in the university degrees were on average 37 credits (ranging from 35 to 40 credits). During the year 2005–2006, they averaged 43 credits (ranging from 36 to 52 credits). In other words, the relative proportion of Main Discipline studies increased during the examined time period. In addition to the name of the Main Discipline, the range growth is another indication of the gradual differentiation of the curricula in the universities.

Table 3 shows the division of Main Discipline studies into four content classes. These are General Education, Research Studies, Early Childhood Education, and Practice. The studies also include substance studies of Early Childhood Education which provide vocational readiness.

As a general trend, the Main Discipline has expanded in a way that has awarded practical studies the greatest proportional increase. Research studies, now encompassing a variety of course titles, have experienced the second greatest increase. However, most research study periods were clearly structured on basic studies and subject studies in General Education. As a general observation, we can furthermore state that the perspective in research studies was mainly in accordance with General Education and lacked a clear focus on studying the youngest children. Except for the practical training period, Main Discipline studies held a nearly equal proportion during the academic year 2005–06. It is to be noted that studies providing vocational readiness are excluded from the scope of this article. At the universities, practical training has also been placed in varying structure areas within the degree, such as in vocational studies or in optional studies, in addition to Main Discipline studies. Main Discipline studies do not thus include all the studies and practical training periods of Early Childhood Education.

Table 3. Division of the contents of Main Discipline studies (credit points) and percentage of degree on average (%) in the curricula of 1998–1999 and 2005–2006

Contents	*1998–99*	*2005–06*
General Education	11	12
Research studies	10	12
Early Childhood Education	11	12
Practice	5	8
All	37	44
Percentage of degree (%)	31	37

In Table 4 (below), the changes in General Education and the percentage of the Main Discipline are examined in greater detail. Except for the University of Oulu, the contents of General Education has diminished. At the teacher training college of Kajaani in particular, the development is clearly oriented in opposing directions from the other universities. We might also consider this trend as at least partly representing a shift from General Education towards Early Childhood Education, as the practical training periods are always carried out in institutions of Early Childhood Education. In this respect, the Main Discipline is increasingly starting to resemble Early Childhood Education.

Division of theoretical Main Discipline studies according to the sub-fields of Education[9]

When universities are examined as a whole, the averages has been 22 credits in 1998–1999 and

Table 4. Education substance without research studies in the curricula of 1998–1999 and 2005–2006. Percentages and change of the Main Discipline (%)

University	*1998–99*	*2005–06*	*Change*
Helsinki	9	0	–9
Joensuu/ Savonlinna	18	17	–1
Jyväskylä	49	21	–28
Oulu	0	2	+2
Oulu/Kajaani	6	27	+21
Tampere	30	25	–5
Turku/Rauma	57	37	–20
Åbo Akademi/ Pietarsaari	37	14	–23

Table 5. Sub-fields in Education on average in the curricula of Finnish universities, years 1998–1999 and 2005–06 (credits in Main Disciplines on average)

Sub-field	*1998–99*	*2005–06*
Psychology of Education	3.3	4.7
Sociology of Education[a]	1.2	4.1
Didactics	11.6	8.4
Philosophy of Education	0.8	1.1
History of Education	0.6	0.7
Comparative Education	0.2	0
Special Education	1.4	1.2
Others[b]	2.7	3.2

a. This category consists of studies focusing on culture/history and education/society. The term "sociology of education" was not used in all of the examined curricula.

b. This group includes those studies which cannot be clearly categorize from the above mentioned contents classes for example because of the multidimensionality of studies.

23 credits in 2005–2006 (Table 5), while the total number of theoretical Main Discipline studies has remained nearly unchanged. Instead, the emphasises within these studies have changed. The emphasis on didactics has diminished, while educational psychology and educational sociology in particular have received more prominence. The proportions of philosophy of education, comparative education, and the history of education are strikingly small. Attention is also paid to the sparseness of Special Education that remains despite the recent public debate in Finland on the increasing significance of and demand for this particular field of expertise.

In Figures 1 and 2, the sub-fields of Education are examined according to university to illustrate differences in emphasis. Some of the training units emphasized Didactics. These units were Oulu, Åbo Akademi, Savonlinna, Helsinki, and Kajaani. In contrast, the proportion of Didactics is minor in the University of Jyväskylä. In the Rauma training unit, at the University of Turku, and at Jyväskylä, educational psychology enjoys a large relative proportion. Special Education was not included in the Main Discipline studies at three universities (Oulu, Tampere, and Jyväskylä) and educational sociology at another three universities (Oulu, Åbo Akademi and Kajaani).

Figure 2 shows a decrease in didactics at all universities. At the University of Jyväskylä, educational sociology has replaced educational psychology. Educational sociology has also clearly been on the rise in the University of Tampere and in Åbo Akademi. In Helsinki, Savonlinna, and the Åbo Akademi, educational psychology has also increased. Special Education is missing altogether in Åbo Akademi and the University of Oulu.

Research Studies

What proportion do educational research studies have in the degree and in its curriculum? Table 6 shows the number of credits for these studies and their proportion in the entire degree of the kindergarten teacher's candidate level (BA) for the year 2005–2006 as well as the change in the relative proportion since the year 1998–1999.

Figure 1. Structural volume of theoretical educational studies* in the curricula of Finnish universities, year 1998–1999 (credits in Main Disciplines).

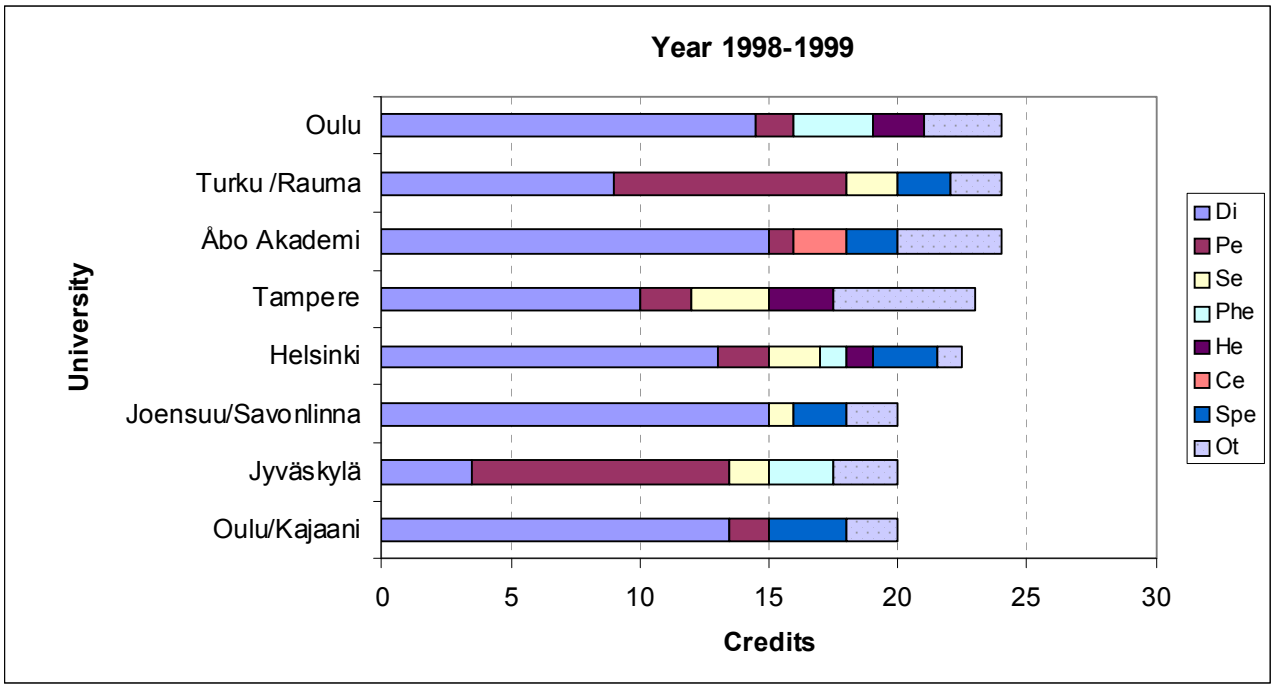
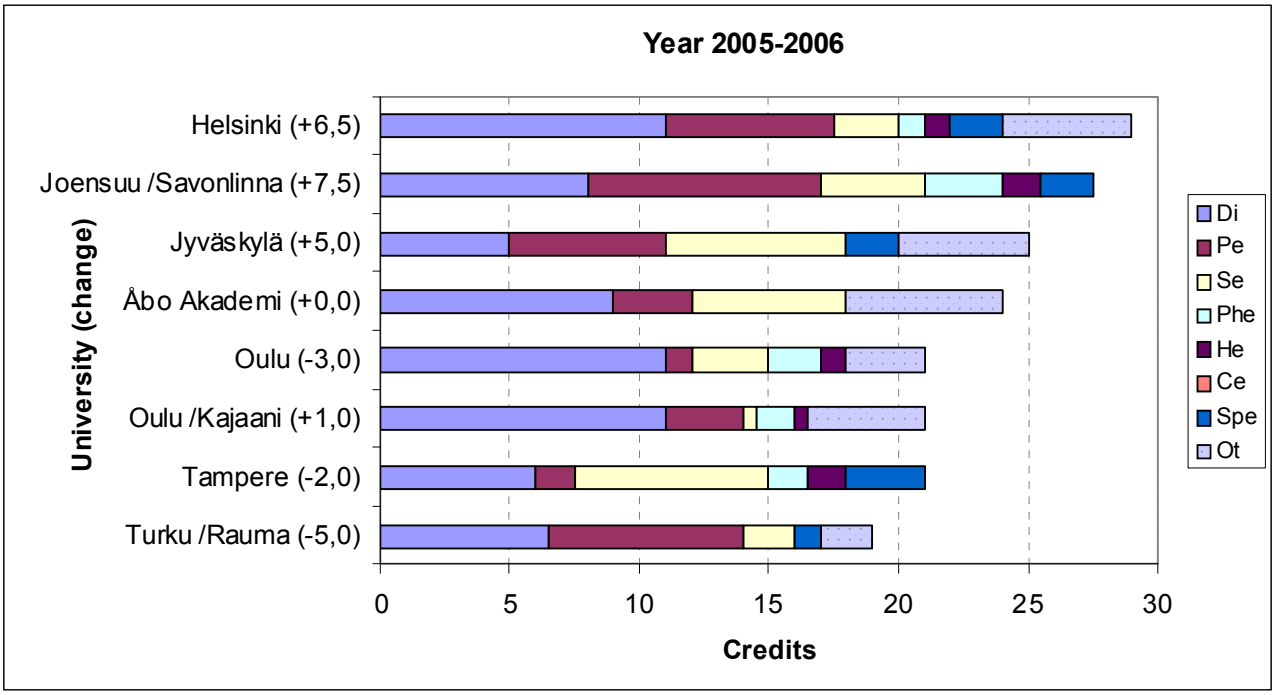


Figure 2. Structural volume of theoretical educational studies* in the curricula of Finnish universities, year 2005–2006 (credits in Main Disciplines).



* The abbreviations in Figures 1 and 2 are: **Di** (Didactics), **Pe** (Psychology of Education), **Se** (Sociology of Education), **Phe** (Philosophy of Education, **He** (History of Education), **Ce** (Comparative Education), **Spe** (Special Education), and **Ot** (other).

Table 6 indicates that research studies are clearly emphasized in the degree as opposed to subject studies. As a general trend, we can state that research studies have increased towards the end of the examined time period, constituting approximately 10–12% of the entire degree. This is particularly evident in the case of the University of Turku.

Table 6. Research studies in credits and their relative proportion in the degree in 2005–2006 and the change in the relative proportion since 1998–1999

University	*Basic studies*	*Subject studies*	*All*	*Percent of degree*	*Change*
Helsinki	3	9.5	12.5	10	0
Joensuu/Savonlinna	2	10.5	12.5	10	1
Jyväskylä	2	10	12	10	3
Oulu	3	12	15	13	1
Oulu/Kajaani	3	9	12	10	1
Tampere	3	12	15	13	1
Turku/Rauma	0	12	12	10	7
Åbo Akademi/Pietarsaari	0	11	11	9	2

Content of Early Childhood Education in Main Disciplines

Early Childhood Education was gradually introduced in grade studies in Education from the early 1990s on, as a prelude to the shift to university level Early Childhood Education in 1995. Prior to this, Education studies in kindergarten teacher training units also mainly focused on the education and teaching of school-aged children and adolescents. Tables 7a and 7b show the proportion of Early Childhood Education in the grades of Education in each university. The criteria for the classification were the title of the course, the written objectives, the content description, and the contents of the required reading.

Table 7a. Substance area of Early Childhood Education in credits and its relative proportion in the grades of Education during the year 1998–1999

University	*Basic studies*	*Subject studies*	*All*	*Percent of Main Discipline*
Helsinki	9	10.5	19.5	56
Joensuu/Savonlinna	6	14	20	53
Jyväskylä	3	7	10	29
Oulu	12	9	21	60
Oulu/Kajaani	14	16	30	77
Tampere	2	10	12	32
Turku/Rauma	2	9	11	31
Åbo Akademi/Pietarsaari	4	9	13	37

During the year 1998–1999 (Table 7a), the proportion of the substance area of Early Childhood Education in the Main Discipline varied between 29% and 77%, while the average proportion was 47%. The range excellently illustrates the structure of the Main Discipline in kindergarten teacher training, statutorily defined as a combination of General Education and Early Childhood Education (i.e. Education, especially Early Childhood Education). The proportion of Early Childhood Education is under 50% in the Universities of Jyväskylä, Tampere, and Turku and in Åbo Akademi. In four universities, Early Childhood Education includes practical training of 7 credits on average.

Table 7b. Substance area of Early Childhood Education in credits* and its relative proportion of the grades of Education during the year 2005–2006 and the change of relative proportion since the year 1998–1999.

University	*Basic studies*	*Subject studies*	*All*	*Percent of Main Discipline*	*Change*
Helsinki	12	16	28	68	+12
Joensuu/Savonlinna	10	16	26	57	+4
Jyväskylä	4	21	25	57	+28
Oulu	11	17	28	64	+4
Oulu/Kajaani	0	18	18	44	–33
Tampere	0	18	18	41	+9
Turku/Rauma	2	7	9	26	–5
Åbo Akademi/Pietarsaari	12	15	27	61	+24

* All universities did not systematically give the information for the year 2005–2006 in credits but instead in ECTS. In converting the ECT into a credit, the coefficient 1.7 was used.

During the year 2005–2006 (Table 7b), the proportion of the substance area of Early Childhood Education remained large (26%–68%), while the average proportion was 52%. An evident trend here is an increase in the substance area of Early Childhood Education in the Main Discipline. The proportion of Early Childhood Education is clearly lower than 50% in the branch unit of Rauma (University of Turku). Instead, the proportion in the University of Tampere has already risen by 41%. The branch unit of Kajaani (University of Oulu) represents the most substantial exception to this trend. The proportion of practical training in the Main Discipline clearly increased in the curriculum of the 2005–2006. At one university exclusively, the Main Discipline did not include practical training. The area of Early Childhood Education contained 9 credits of practical training on average. Practical training was integrated into the Main Discipline as "practice which improves pedagogical expertise".

CONCLUSIONS

Throughout its existence, the daycare system in Finland has been a subject of passionate and contradictory ideological interests. This has been reflected, for example, in the infrequent placement of children in day care outside the home, in the diminishing relative proportion of kindergarten staff with proper pedagogical training, and particularly in an increasing shortage of kindergarten teachers. The status and importance of Early Childhood Education has also varied, depending on whether the public debate has emphasized the socio-political or the education-political function of day care. Consequently, kindergarten teachers and their work have also been a subject of conflicting attitudes and

perceptions. The kindergarten field has by turns witnessed both a disparaging discourse and one that highlights professional work. (Kinos, 2008; Niikko, 2006; OECD, 2006.)

It has not been until very recently that the attitudes towards day care have become primarily positive. One example of this is the fact that opportunities for graduate and post graduate studies in (Early Childhood) Education at universities have created career paths and tenure tracks for kindergarten teachers as well as a sound research basis to rehabilitate teachership. The semi-professional status of kindergarten teachers has, indeed, experienced an upward trend. Kindergarten teachers are and will be able to improve and develop their practice and profession and the related knowledge requirements and skills via fixed contacts with universities and the scientific community.

The formation of Early Childhood Education within the field of Education can be summarized in four main shifts which reflect the development launched in the mid 1990s. These shifts are:

- Educationalisation of ECE
- Early childhood educationalisation of the science of Education
- Development of the science of Early Childhood Education
- Differentiation of the educationalisation of ECE by individual universities.

On the whole, we can state that differences in emphasis between the universities seem to have emerged in the Main Discipline. On the basis of the data, universities indeed seem to have profiled Early Childhood Education differently. In the late 1990s, a differentiated independent specialty of Early Childhood Science in the Universities of Helsinki and Oulu and as well as in Joensuu (Savonlinna) seemed to be developing. Whereas the statutory based combination (Education, especially Early Childhood Education) seemed to be popular in Jyväskylä, in Tampere, and in Turku (Rauma). In Rauma, the relative proportion of Early Childhood Education is the smallest. The curricula indicated that the perspective in basic studies often follows that of general Education (in Kajaani, Oulu, and Jyväskylä in particular). The emphasis on Early Childhood Education emerges in subject studies. In Rauma, the perspective in subject studies also clearly points to General Education in particular, as in subject studies the proportion of the substance area of Early Childhood Education consists of mere practical training.

On the basis of the analysis of the curricula, two conflicting developments can be outlined in the shaping of academic Early Childhood Education:

1) Early Childhood Education will continue to develop as a sub-field of General Education (Education, especially Early Childhood Education) as a discipline during the time examined. Due to their autonomy, it has been possible for the universities to emphasize the contents of the teaching and the study within the disciplines as desired.

2) The University of Jyväskylä has indeed pioneered in defining a fourth science of Education, the science of Early Childhood Education, as a Main Discipline.

The development thus far in the curricula of the Main Discipline can be summarized in detail with the findings of the quantitative growth in Main Discipline and the facts that the proportion of General Education has diminished and the proportion of the substance of Early Childhood Education has increased.

Research studies are an essential part of the Bachelor's degree, and the number and variety of research studies has increased. Educational psychology, the sociology of education, and didactics are the main sectors of the Main Discipline. But while the emphasis on didactics has diminished, the proportion of educational sociology and social issues has increased. The amount of practical training has increased, as well.

The differentiation of the training units has increased in regard to the Main Discipline. Education, especially Early Childhood Education is still the Main Discipline in the curriculum of five universities in spite of the statutory change, Education is a Main Discipline in the curricula of three universities and for the present, the science of Early Childhood Education is a Main Discipline in one Finnish university.

The development seems to be deviating from the preschool teachers' training arrangements in Norway, Sweden, and Denmark (e.g. Johansson, 2006). Interesting topics for further comparative research include defining the science of Early Childhood Education and the ways in which the universities will each meet the anomaly set by the University of Jyväskylä. As Thomas S. Kuhn (1969) has written:

> *... normal science, the activity in which most scientists inevitably spend almost all their time, is predicated on the assumption that the scientific community knows what the world is like. Much of the success of the enterprise derives from the community´s willingness to defend that assumption, if necessary at considerable cost. Normal science, for example, often suppresses fundamental novelties because they are necessarily subversive of its basic commitments. Nevertheless, so long as those commitments retain an element of the arbitrary, the very nature of normal research ensures that novelty shall not be suppressed for very long. Kuhn (1969/1962, p. 5)*

Also the new situation of the shifting paradigm can be described in the words of Christopher J. Hurn (1993): "Universities still educate students in the traditional arts and sciences, but they increasingly see their task as training students in highly specialized fields." According to our view, other universities have to react sooner or later to the new anomaly created by the Science of Early Childhood Education in one of the universities.

NOTES

1. The premises and the findings of the research project have been presented earlier in the EECERA conferences in Dublin and Reykjavik, in the World Curriculum Studies conference in Tampere, in conferences of Education in Finland in Jyväskylä and Oulu, and in the NERA conference in Turku (Kinos & Virtanen 2005a; 2005b; 2006a; 2006b; 2006c; 2007).

2. The planning of the curriculum for the year 2005–2006 already began during the Bologna Process, which is why all the ideas introduced by the Process do not yet necessarily show in the curricula in question. The validity of curricula varied according to the university from one to three years, and consequently, only the curricula from late in the decade can be considered 'established' curricula fully in accordance with the Bologna Process.

3. Such studies include, for example, the study modules Historical and philosophical foundations of Education and Education, Schooling and Society.

4. Such studies are, for example, Introduction to Research on Education and Quantitative Methods in Educational Research.

5. Such study modules are, for example, Pedagogy of Early Childhood Education and Play as a Pedagogical Method.

6. Such study modules are for example: Orienting Practice and Ending Practice

7. The scope of the degree is no longer given as credits but as ECTS (180).

8. In the decree on degrees, the official title of this area is *Early Childhood Education and preschool education studies* which give vocational readiness, which consist with varying emphasis of Early Childhood Education, psychology, and the practical subjects and arts subjects. The scope in its entirety is 35 credits.

9. Theoretical Main Discipline studies here refer to studies in the substance area of General Education and Early Childhood Education.

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