Comparative study of teaching content in teacher education programmes in Canada, Finland and Singapore versus Denmark

**Abstract**

This article presents the results of a comparative study of the content in teacher education programs for primary and lower secondary teachers in Canada, Denmark, Finland and Singapore. First and foremost, the study is a comparison between teacher education programs in, on the one hand, Canada, Finland and Singapore, all of which score highly in international comparisons such as PISA and TIMMS, and on the other hand Denmark, which receives average scores, but it also functions as a comparison between all four countries. The study does not offer proof of any clear difference between the Danish teacher education programs and those found in the top-performing countries. Two main findings are: 1) Philosophically-based professional knowledge, much of which is normative in character, forms an extensive part of the body of professional knowledge within the Danish teacher education programs, which is not true of the programs in the Top-3 countries. 2) The programs in Canada and Singapore more frequently employ literature combining research-based knowledge with practical guidance and experiences, while the programs in Denmark and Finland keep these knowledge forms separate.

**Keywords:**

Teacher education, teachers’ knowledge base, comparative study

# Introduction

There is support from research for the view that teacher quality plays a decisive role in determining students’ learning outcomes. Research on teacher education stresses fairly unequivocally that teachers’ expertise or – to use an increasingly popular term - capacity

 ([Grant, 2008](#_ENREF_8)) is the single most important factor in explaining students’ learning outcomes (Darling-Hammond & Young, 2002), (Darling-Hammond & Brasford, 2005), ([OECD, 2005](#_ENREF_13)), ([Day, Day, Qing, & Stobart, 2009](#_ENREF_5)). Teacher quality shows significant and positive correlation with student results (Hanushek, 2002), and it is directly suggested that a school system’s boundary of quality is drawn by the quality of its teachers (Barber & Mourshed, 2007).

It is likewise well documented that teaching content in teacher education programmes plays a crucial part in the development and composition of the knowledge base which teachers can draw upon when performing their profession. Research suggests that teachers’ clear mastery of the material to be taught, i.e. subject knowledge, is an important factor for good teaching ([Weinert, Schrader, & Helmke, 1990](#_ENREF_21)) ([Einsiedler, 1997](#_ENREF_7)) ([Wayne & Youngs, 2003, s. 97](#_ENREF_20)) ([Darling-Hammond & Youngs, 2002, s. 19](#_ENREF_4)). Knowledge about teaching, i.e. subject didactic knowledge, is also ascribed considerable importance for teacher quality. A number of studies have indicated that the relationship between teacher quality and subject didactic knowledge and competences is stronger and more consistently positive than that to subject knowledge ([Darling-Hammond, 2000](#_ENREF_1)). However, research on teachers’ knowledge base has in particular demonstrated that it is the complex and intricate interaction between subject knowledge and subject didactic knowledge which can lead to an increase in the overall quality of teaching ([Schrader, 1989](#_ENREF_19)) (([Weinert, Schrader, & Helmke, 1990](#_ENREF_21)) ([Darling-Hammond, 2000](#_ENREF_1)) ([Darling-Hammond & Youngs, 2002, s. 19](#_ENREF_4)) ([Hattie & Yates, 2014](#_ENREF_1)).

The extensive reforms implemented in recent years moving schools from content-based to standards- based education, and thereby to management according to performance standards and accountability requirements, have not only underlined the importance of a strong relationship between subject knowledge and subject didactic knowledge, as mentioned above, but also that teachers’ knowledge capacity must incorporate knowledge about differentiated teaching, classroom management, assessment and feedback techniques ([Grant, 2008](#_ENREF_8)), as well as about student proficiency, typically involving child development and how to teach students with special needs, the highly gifted, and classes with high levels of student diversity ([Darling-Hammond, Hammerness, Grossmann, Rust, & Schulman, 2005](#_ENREF_3)) ([Darling-Hammond, 2006](#_ENREF_2)).

The comparative study presented in this article has the aim of contributing to the existing body of research on teachers’ knowledge base. It offers an empirical, comparative investigation of the teaching content, i.e. texts (articles, reports, books etc.), in teacher education programmes in three countries – Canada, Finland and Singapore – whichachieve high rankings in international comparisons, and in Denmark which receives average results, as well as comparing the selected programs in each of the four countries.

# Object of research

Among the top-performing OECD countries in PISA 2006, one finds Korea, Finland and Canada. Singapore does not take part in the PISA assessments, but was among the top-performing countries in TIMMS 2007 where Finland, Korea and Canada did not participate. Denmark takes part in both assessments, achieving an average placing in each case. This pattern was repeated in PISA-2009, in which also Singapore took part.

In this study, we included four teacher education programmes: Ontario Institute for Studies in Education (OISE) Ontario, Canada, Helsinki University, Helsinki Finland and National Institute of Education (NIE), Singapore, and three University Colleges in Denmark. We do neither assume nor claim that teacher education explains the three countries top-ranking. We only used the top-rakings as criteria for selection of countries to be included in the study.

## Teacher education programmes

The teacher education programmes in the four countries are organised in different ways: In some cases there is a decentralised system, in others the system is more centralised; in some countries there is one type of programme for primary and secondary teachers, in other countries there are several; teacher education programmes are sometimes concurrent, sometimes consecutive. These differences have necessitated variations in the compilation of teaching materials to be used in the study. The analysis of teaching materials from teacher education programmes in the four countries has comprised three activities: compilation of teaching materials, analysis of these materials, and comparison of results.

**Table 1: Teacher education programmes in the four countries**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Ontario** | **Denmark** | **Finland** | **Singapore** |
| **System** | Decentralised | Decentralised | Decentralised | Centralised |
| **Number of programmes** | 4 programmes | 2 programmes | 2 programmes | 3 programmes |
| **Programme providers** | 13 universities | 7 University Colleges | 8 universities | 1 university-institute |
| **Programme type** | Consecutive and concurrent | Concurrent | Concurrent | Consecutive |
| **Population** | 13.150.000 | 5.500.000 | 5.200.000 | 5.000.000 |

In Canada, the compilation of teaching materials was carried out in the province of Ontario, even though this province is not the highest performing Canadian province in the PISA assessments, which is Alberta. However, there are only negligible differences in relation to Ontario, and so, as Ontario is Canada’s largest province, it has been selected in order to provide a more representative sample. In Ontario, teacher education programmes are offered at thirteen accredited universities. Here, we concentrate on the teaching content of the teacher education programme at the Faculty of Education, Ontario Institute for Studies in Education (OISE), University of Toronto, which is the largest and most prestigious provider of teacher education in the province. Of the four teacher education programmes offered, the one-year Bachelor of Education programme was the largest in terms of student population, and it is this programme which has been included in the study.

The one-year Bachelor of Education programme qualifies graduates to teach at levels from nursery class to Grade 8 (K-8). Teaching materials were compiled during a visit to the faculty from 22 to 26 March 2010.

In Denmark, teacher education is decentralised, but in accordance with common legislation (Danish Ministry of Education, 2006). Of the two teacher education programmes offered (the professional bachelor’s degree programme and the accelerated *meritlærer* programme awarding credit for prior learning), it is the four-year (240 ECTS) professional bachelor’s degree programme, qualifying graduates to teach grades 1-9 (10), that is included in the study. This programme is offered at seven University Colleges, each with several locations. The study includes the teacher education programmes at Zahle, University College Capital, Silkeborg at University College VIA, and Vordingborg at University College Sealand. These three programmes are located in a city, a large provincial town and a smaller provincial town respectively. Teaching materials were compiled during the period from 12 March to 1 April 2010.

In Finland, the teacher education system is decentralised. Programmes are offered at eight universities which, as autonomous institutions, each responsible for their own respective teacher education programmes. This means that the programmes can differ considerably between universities. In this study, we analyse the content of the teacher education programme at the Department of Teacher Education, Helsinki University. The department offers both the class teacher programme (Grade 1-6) and the subject teacher programme (Grade 7-12). Both programmes are included in the study. Teaching materials were compiled during a visit to the department from 10 to 12 March 2010.

In Singapore, teacher education is centralised and offered at the National Institute of Education (NIE). NIE offers three teacher education programmes providing qualifications to teach at either primary (1-6) or secondary level (7-11(12)): 1) A four-year concurrent bachelor’s degree programme (BA(Ed) or BSc(Ed)); 2) A two-year concurrent diploma degree programme (Dip.Ed.); 3)A three-year Postgraduate Diploma in Education (PGDE) aimed at students who already have a bachelor’s degree but require an educational postgraduate qualification in order to teach at primary or secondary level. All three programmes are included in the study. Teaching materials were compiled during a visit to NIE from 15 to 19 March 2010.

## Subjects and content

The organisation of the two subject areas covered by the study (educational theory and mathematics) differs between the four countries. At the Ontario Institute for Studies in Education (OISE), in addition to Mathematics courses, the study includes the following subjects from the field of educational theory: Teacher Education Seminar (TES), Psychological Foundations, School and Society, and Curriculum and Instruction. At the selected institutions in Denmark, the following subjects are included: Educational Science, Psychology and General Didactics, as well as Mathematics. In Finland, the subjects Educational Science and Mathematics are analysed. Finally, in Singapore, the educational science group of subjects (Educational Psychology, ICT for meaningful/engaged learning, and The social context of teaching and learning) are included alongside Mathematics.

Teaching content in teacher education programmes is understood as texts (articles, reports, books etc.) employed in courses in the subjects included in the study. Only teaching materials found in curricula, syllabi, course regulations, examination reports, lists of recommended literature or other institutional documents governing the respective teacher education programmes are included.[[1]](#footnote-1) In cases where the subjects in question are comprised of courses of one year (or less) in duration, the teaching materials are compiled for the respective courses. When the subjects are spread across several years within the programme, teaching materials are compiled for the year of the final examination in the subject.

# Theoretical framework and method

## Analysis of teaching content

The comparison of differences and similarities in the content of the selected subjects in the four teacher education programmes is conducted on the basis of a number of concepts, here referred to as search and analysis categories. ([Rose, 1991](#_ENREF_16)), ([Sartori, 1984](#_ENREF_17)).

The analyses of teaching content are conducted as text analysis on the basis of such preselected and further differentiated search and analysis categories. The analysis of the material builds on a distinction between four types of knowledge: scientific knowledge, scientific practice knowledge, professional knowledge, and professional practice knowledge.

The four types of knowledge have their origins in Emile Durkheim stressing that educational theory and educational practice are not the same. Educational theory is reflection on educational practice and its possible ideal forms. Furthermore, nor is educational theory the same as educational science, a field preoccupied with studying upbringing and education as a whole ([Durkheim, 1956](#_ENREF_6)).[[2]](#footnote-2) Durkheim enables a distinction between educational practice, educational theory and educational science. Building on this, Niklas Luhmann has pointed out that teaching and education are produced within two of society’s different functional systems, namely the system of science and the system of education respectively, and that each of these systems operate with different sets of criteria and objectives . Both systems have their own practice: for the system of science, research practice; for the system of education, educational practice ([Luhmann, 2002](#_ENREF_10)) ([Rasmussen, Kruse, & Holm, 2007](#_ENREF_15)).

*Scientific knowledge* about education and teaching is knowledge about the educational system which is produced outside the educational system, with a different frame of reference than that employed by the educational system itself. Scientific knowledge is characterised by its distinction between true and false statements, an aspiration towards generalised or generalizable research results, the coordination of concepts which form the basis for observation and the range of conclusions by theory, and the application of specific and explicit methods. Scientific knowledge has the ambition of explaining or understanding a phenomenon without necessarily commenting upon how to intervene.

In this study, we within the search and analysis category scientific knowledge additionally distinguish between empirical scientific knowledge and analytic/theoretical scientific knowledge. Empirical scientific knowledge can be generated through the application of quantitative, qualitative or mixed methods. Analytic/theoretical scientific knowledge can be further divided into grand theory (philosophical, psychological, sociological etc.) and middle-range theories (e.g. Piaget’s adaptation theory, learning theories, theories about social inequality etc.), a conceptual distinction with roots in sociology, but here applied more broadly ([Merton, 1968](#_ENREF_11)).

*Scientific practice knowledge* is knowledge the researcher and research community generates by itself and for itself concerning the research process. It typically comprises reflections on the theory of science, not least questions of an epistemological nature, as well as reflection on research methodology and its possible applications and limitations.

*Professional knowledge* about education and teaching is knowledge which is produced within the educational system about the educational system and for the educational system, i.e. with the educational system’s own frame of reference. Professional knowledge is characterised by its distinction between instructive and not-instructive statements regarding teachers’ practice. As such, professional knowledge acts as the educational system’s own way of correcting professional practice according to a self-generated set of criteria for determining success or failure. Professional knowledge is developed with the aim of solving concrete problems in local contexts and therefore mainly comprises context-specific knowledge. Its function is to explain practice in order to enable intervention aimed at improving practice.

The search and analysis category professional knowledge is further divided into evidence-based professional knowledge and philosophical professional knowledge. Evidence-based professional knowledge refer to either research or developmental work and action research, while philosophical professional knowledge is characterised by offering either analytical or normatively-based directions for practice. This distinction has its foundations in two different characteristics of professional knowledge: on one hand, professional knowledge can be based on more or less systematic descriptions of experiences from educational practice; on the other hand, professional knowledge can consist of ideas or ideals for successful practice. Evidence-based professional knowledge referencing research can additionally be distinguished dependent on the empirical or analytic/theoretical nature of this research, while philosophical professional knowledge can have either an analytic or a normative orientation.

*Professional practice knowledge* about education and teaching is the type of knowledge which practitioners generate by and for themselves with the goal of facilitating a more effectual practice. Professional practice knowledge is characterised by a distinction between useful and not-useful knowledge, a distinction which combines two criteria for professional practice, namely if it ‘works’, and whether it does so in a reasonable manner, i.e. in a way which the practitioner finds acceptable in terms of e.g. ethical or democratic considerations. Professional practice knowledge is reflection on practice and, as such, experiential knowledge whose function is to contribute to an improvement of the concrete everyday educational practice. Professional practice knowledge is not subject to additional divisions.

**Figure 1: Overview of search and analysis categories for knowledge forms**

In order to ensure the validity of the study of teaching content in the four teacher education programmes, i.e. ensure congruence between the objectives of the study and comparison and the actual findings, the study only includes content which can be found in publicly available curricula and syllabi, examination reports, lists of recommended literature and the like.

It is difficult in a study like this one to ensure reliability, i.e. that the findings would be the same if the study was repeated. In order to ensure a certain degree of reliability, we strove for a high degree of transparency in the compilation and analysis of the selected material. This was achieved by presenting the material in a bibliographical format in the annex of the report of the study (Rasmussen, Bayer & Brodersen, 2010) which makes it possible to find the same sources again such that descriptions and characterisations can be verified.

# Teaching content in the teacher education programmes

## OISE, Ontario, Canada

At the Ontario Institute for Studies in Education (OISE), literature is listed in the syllabi for all the subjects that form part of the programme for the Bachelor of Education, a total of 66 titles. Of these, 63 have been identified and analysed. Five titles are used in more than one subject.

At the level of the four overall categories of knowledge, seven entries are categorised as scientific knowledge, one as scientific practice knowledge, 36 as professional knowledge, and 19 as professional practice knowledge. As such, professional knowledge comprises the largest share of entries, but professional practice knowledge also represents a significant proportion of the total number of entries.

The modest number of entries within the categories of scientific knowledge and scientific practice knowledge deal with empirical research findings (3) and analytic/theoretical knowledge (4). In the category of scientific practice knowledge, there is one title concerning research methodology and none on the theory of science.

In terms of professional knowledge, the majority are evidence-based (29 entries). Of these, 10 refer to both research and practice, while 10 refer only to research and nine only to practice. Six titles deal with normatively oriented philosophical professional knowledge and one refers to both evidence and philosophy. Professional practice knowledge comprises the second largest share of entries (19).

**Figure 2: Ontario Institute for Studies in Education (OISE)**

The teaching content of the Bachelor of Education focuses strongly on professional knowledge and professional practice knowledge. It would seem clear that an attempt to strike a balance between evidence-based professional knowledge and knowledge regarding what is possible in the classroom, i.e. professional practice knowledge, is central to the selection of the programme’s teaching content. As a prerequisite for their admission to the programme, students have a four-year bachelor’s degree, typically within two school subjects, and this explains why the content is dominated by subject didactics. Furthermore, the teaching content in the programme is clearly aimed at developing the performativity of the teacher-to-be and at providing guidance in successful teaching strategies. There is a particular emphasis on teaching classes with high levels of student diversity in terms of ethnicity and culture.

## Zahle, Silkeborg, and Vordingborg, Denmark

At the three educational institutions included in the study, 496 titles are reported from the subjects Educational Science, Psychology and General Didactics and Mathematics: of these, 463 have been identified and analysed.

At the overall level, the content of the analysed material is divided between all four categories of knowledge: 64 entries are categorised as scientific knowledge, seven as scientific practice knowledge, 331 as professional knowledge, and 61 as professional practice knowledge. Professional knowledge thereby comprised by far the largest proportion of titles.

The 64 titles within the category of scientific knowledge can be further distinguished between 46 entries based on analytic/theoretical research, 16 entries based on empirical research and two entries on both analytic/theoretical and empirical research. The seven titles belonging to the category of scientific practice knowledge concerns the theory of science.

The vast majority of titles within the professional knowledge category are based on evidence-based research (142), while 62 refer only to practice. Philosophical professional knowledge is at the centre of 114 entries, 45 of which are both normatively and analytically oriented, 14 purely analytic, and 55 entirely normative. Professional practice knowledge comprises 61 titles.

**Figure 3**: **Zahle, Silkeborg, and Vordingborg, Denmark**

The analyses of teaching material in the Danish teacher education programmes show a strong focus on professional knowledge. Scientific knowledge features to a limited extent while professional practice knowledge is minimally represented and scientific practice knowledge virtually absent. A considerable proportion of the material is based on research. The large number of titles included at the three educational institutions is also worth noting and can be seen as evidence of the high pedagogical freedom given to instructors.

## University of Helsinki, Finland

For the class teacher programme at the University of Helsinki (Grade 1-6), all compulsory titles are included in the study (28). They are divided between just three of the four categories of knowledge: scientific knowledge, scientific practice knowledge, and professional knowledge. There are no examples of professional practice knowledge. At this overall level, three titles are categorised as scientific knowledge, nine as scientific practice knowledge, and 16 as professional knowledge.

Scientific knowledge in the form of results of empirical research comprises the smallest category with three entries. The second largest category is scientific practice knowledge of which the majority deal with research methodology (7-8), the remainder concerning theory of science (1-2). However, professional knowledge comprises the largest proportion of teaching materials included in the Finnish class teacher education programme. 12 titles are evidence-based referring to empirical and/or theoretical research (primarily theoretical). Four entries are categorised as philosophically oriented professional knowledge, three of which have a normative basis.

**Figure 4: University of Helsinki, Finland, class teacher**

For the subject teacher programme at the University of Helsinki (Grade 7-12), all compulsory titles are included in the study (22) and categorised according to the four overall categories of knowledge. Scientific knowledge includes four titles, three of which can be placed within the analytic/theoretical middle-range theory sub-category an one in the empirical research category. Scientific practice knowledge comprises three titles, all dealing with research methodology. Professional knowledge includes six titles which are evidence-based referring to primarily theoretical and/or empirical research, in addition to three titles based on evidence from studies of practice. Further three titles are philosophical professional knowledge with a normative foundation. Finally, three titles can be categorised as professional practice knowledge.

**Figure 5: University of Helsinki, Finland, subject teacher**

Many of the titles included in the subject teacher education programme are the same as those found within the class teacher programme. However, the subject teacher education programme does differ from the class teacher education programme in that it incorporates professional practice knowledge comprising material which provides inspiration for assessing teaching and language learning.

## NIE, Singapore

For the teacher education programmes at the National Institute of Education (NIE), ten titles are reported of which eight have been identified and analysed. All titles fall within the category of evidence-based professional knowledge. The teaching materials are to a large extent instructive and in some cases almost prescriptive in relation to educational practice. Most of the titles are founded on evidence-based knowledge from research (6) and from experimental and development work (2). The very modest number of titles can be explained by the application of very large (often up to 1000 pages) textbooks in the teacher education programs.

**Figure 6: National Institute of Education (NIE)**

In Singapore the educational subjects are characterised by a general focus on questions with a direct relevance for the decisions teachers make when teaching: questions concerning e.g. planning lessons, classroom management and assessment. Meanwhile, relatively little attention is paid to e.g. questions concerning educational theory (Bildung) and other themes within the philosophy of education. When questions about goals and values are dealt with, it is primarily with reference to the country’s current political priorities and only to a far lesser degree to the possible historical and philosophical foundations.

# Comparison

The study of differences and similarities in the teaching content of the four teacher education programmes has been conducted first and foremost as a comparison between on the one hand, the four top-performing countries Canada, Finland and Singapore, and on the other hand, Denmark. However, differences and similarities between the individual countries are also dealt with to the extent that they offer a contribution to a more nuanced overall picture.

## Differences and similarities in terms of knowledge base

The content in the selected subjects within the teacher education programmes has been analysed on the basis of a theoretically-founded set of categories in terms of different types of knowledge and has been applied to teaching materials in the two subject areas (educational theory and mathematics).

### Professionally-oriented knowledge

As a broad observation, a significant amount of the teaching content in the teacher education programmes in each of the four countries can be classified as professional knowledge. For the teacher education programmes at OISE and the University of Helsinki, this is true of approximately half the entries analysed. The proportion of material falling within this category is even higher in Denmark and at NIE. Even though the teacher education programmes in the Top-3 countries are research-based and situated within a university environment, while the Danish teacher education programmes are development-based and situated at university colleges, the teaching content is in all cases clearly aimed at preparing students to enter the teaching profession and perform teaching practice.

Only by further analyses of the professional knowledge the differences between the four teacher education programmes become apparent. In order to do so, the category of professional knowledge has been further divided into the sub-categories of evidence-based professional knowledge and philosophical professional knowledge. *Evidence-based professional knowledge* is the type of knowledge which refers to the results of research or of action research and experimental and development work. *Philosophical professional knowledge* is characterised by providing normatively-based guidelines for practice.

### Evidence-based professional knowledge

At OISE, the great majority of titles within the category of professional knowledge are categorised as evidence-based professional knowledge (30), while a smaller number deal with philosophical professional knowledge (6). At University of Helsinki, one finds a similar distribution between evidence-based (12+9) and philosophical professional knowledge (4+4), especially in terms of the class teacher education programme. At NIE all eight entries comprises evidence-based professional knowledge (8). Meanwhile, one finds a different pattern in the Danish teacher education programmes. As at NIE, professional knowledge comprises a considerable majority of the titles, but the distribution between evidence-based and philosophically-oriented professional knowledge is quite different. In Denmark, evidence-based professional knowledge once again constitutes the largest proportion of the titles classified as professional knowledge (106), but there are also a considerable number of titles within the sub-category of philosophical professional knowledge (63). As such, the Danish teacher education programmes differ from those in the Top-3 countries by including a weighty share of philosophical professional knowledge.

The teacher education programmes in the four countries do not differ in terms of their employment of professional knowledge, but a clear difference can be observed between OISE and NIE on the one hand and Helsinki and Denmark on the other in terms of teaching content. This difference is that the first two programmes largely employ teaching material combining research-based knowledge with practical experiences and guidelines for practice, while the programmes in Denmark and Helsinki tend to keep these two elements separate to a much greater degree, and moreover, only utilise a small amount of teaching material which refers to practice. The latter is especially true of the Danish teacher education programmes. In this regard, the difference is not so much between Denmark and the Top-3 countries, but rather between the teacher education programmes in Ontario and Singapore and those in Helsinki and Denmark.

### Philosophically-oriented professional knowledge

Philosophically-oriented professional knowledge comprises a substantial part of the content in the Danish teacher education programmes, which is not the case in the other three countries. While philosophically-oriented professional knowledge is employed in these countries, it is only to a much lesser extent than one finds in Denmark. A considerable amount of the philosophical professional knowledge employed in Denmark is of a normative nature. Meanwhile, this is not the case in the other countries where titles belonging to the analytic-philosophical professional knowledge sub-category dominate. A clear difference between the teaching content of the teacher education programmes in Denmark and the Top-3 countries in terms of philosophically-oriented professional knowledge can be observed.

### Professional practice knowledge

At OISE, a considerable number of titles are included which can be classified as professional practice knowledge. No titles are included within this category at NIE or in the class teacher education programme in Helsinki. The subject teacher education programme in Helsinki and the Danish teacher education programmes include only a modest number of titles from the category of professional practice knowledge. On this point it is OISE that stands out from the other countries’ teacher education programmes.

### Scientific knowledge

Scientific knowledge is incorporated within the teacher education programmes in all four countries, although only to a limited extent at NIE. Of the other three countries, scientific knowledge is most predominant at the University of Helsinki and least at OISE with Denmark falling somewhere in between. The incorporation of scientific results of empirical research is modest in all of the teacher education programmes studied. In terms of the results of analytic/theoretical research, a difference can be registered between the programmes at NIE, where this sub-category is not represented at all, and the programmes in the remaining three countries, where they are incorporated to a limited degree.

### Scientific practice knowledge

Scientific practice knowledge, i.e. research methodology and theory of science, is represented in the teacher education programmes in Helsinki with titles concerning research methodology, while this type of knowledge is absent from the teacher education programmes in the other countries.[[3]](#footnote-3)

## Differences and similarities in teaching content

A closer study of titles within the four types of knowledge does not reveal a clear pattern in terms of similarities and differences between the Top-3 countries and Denmark, or between each of the four countries.

### Scientific knowledge

The teacher education programmes at OISE and in Denmark include the results of empirical research concerning increased student diversity within schools. This is a topic resulting from demographic changes, teaching of bilingual students, social diversity, poverty, children from socially disadvantaged backgrounds, and issues relating to educational opportunities and educational equality. The programmes also include scientific knowledge regarding individualisation and the development of children and young people within modern society.

The results of empirical research on teachers’ work, the teaching profession and restructuring are likewise included, as are the results of subject didactic research in mathematics lessons.

### Scientific practice knowledge

At the teacher education programmes at the University of Helsinki, a number of titles concerning research methodology are included – which is not the case in the other three countries. The goal is to provide aspiring teachers with the necessary knowledge and expertise to be able to perform methodical and systematic analysis of their own teaching and to understand and relate to research results.

### Professional knowledge

Professional knowledge covers a wide array of topics relevant to the teaching profession. Student diversity is a central theme, in particular how teachers can cope with this diversity and the resulting complexity. Issues covered here typically include: differentiated teaching; teaching students with special needs; ethnic minorities and refugees; gender, racial and cultural differences; special needs education; inclusion; intelligence; and classroom management. Another theme deals with the development of children and young people and the formation of their attitudes, their socialisation, and theories of learning. Teaching comprises a third theme within the category of evidence-based professional knowledge with topics including: (effective) teaching methods and their relevance in relation to different subjects and different students; the development and structure of positive learning environments; and assessment. Finally, one also finds themes such as school development and educational systems.

Within the realm of philosophically-oriented professional knowledge, particular attention is paid to educational theory (Bildung) topics, action competence and theories concerning democracy and democratic education, as well as recognition, care and the forming of relationships. This philosophical, normatively-oriented professional knowledge, which primarily assumes the form of reflections on educational theory, is a hallmark of the Danish teacher education programmes.

### Professional practice knowledge

Within the category of professional practice knowledge, one finds titles passing on teachers’ experiences with conducting courses of study in language and Mathematics; teaching of refugees; parent-teacher co-operation; and matters relating to information and confidentiality.

## Summary

This comparative study does not offer proof of any clear difference between the Danish teacher education programmes and those found in the top-performing countries. While differences can be found in certain areas, in other areas there are greater differences between the four individual countries.

Professional knowledge comprises a significant proportion of the teaching content in the Top-3 countries as well as in Denmark. Teacher education programmes in each of the four countries are clearly professionally-oriented in this respect. Philosophically-based professional knowledge, much of which is normative in character, forms an extensive part of the body of professional knowledge within the Danish teacher education programmes, which is not true of the programmes in the Top-3 countries.

The teacher education programmes at OISE and NIE employ evidence-based professional knowledge referencing and combining research-based and practice-based knowledge. Meanwhile, in Denmark and at the University of Helsinki this type of knowledge for the most part solely references research. A similar difference applies in that the programmes at OISE and NIE more frequently employ literature combining research-based knowledge with practical guidance and experiences, while the programmes in Denmark and Helsinki keep these knowledge forms separate and only incorporate experiences from practice to a limited degree.

The teacher education programme at OISE is distinguished from the programmes in the three remaining countries by including a number of titles from the category professional practice knowledge. The teacher education programmes at NIE are distinguished by incorporating only to a very limited degree the results of empirical research and by the complete absence of the results of analytic/theoretical research. The main distinguishing feature of the teacher education programme at the University of Helsinki is the inclusion of literature on research methodology within the category of scientific practice knowledge.

There is a difference between the institutions offering consecutive programmes (OISE and NIE) and those offering concurrent programmes (Helsinki and Denmark) in terms of the content of the subjects taught within the area of mathematics. In the consecutively organised teacher education programmes, teaching content consists entirely of subject didactics, while the concurrent programmes also cover subject knowledge within these disciplines. The Danish teacher education programmes incorporate both subject didactic literature and subject knowledge literature in the same courses, while the programmes at the University of Helsinki keeps the two areas of knowledge separate in subject didactic courses and courses within the subjects held at their respective departments within the university.

# Interpretation

Despite the relative homogeneity in terms of the professional orientation of teaching content, two clear differences are especially apparent. One is the difference between the Danish teacher education programmes and those found in the other three countries. The other is the difference between on the one hand the Danish and Finnish programmes, and on the other hand the Canadian and Singaporean programmes. In closing we would like to put forward some possible explanations for these differences. These explanations should first and foremost be considered hypotheses which can form the basis of further research.

The Danish teacher education programmes particularly differ from those in the other three countries by including a large proportion of attitude-based, normatively-oriented teaching content, which is not true of the Top-3 countries. One possible explanation might be that the Top-3 countries and Denmark differ in terms of the institutional placement, structure, and duration of their teacher education programmes. The programmes in the Top-3 countries are all research-based and situated within universities, while in Denmark, teacher education is development-based and situated within university colleges with no research obligations. Furthermore, instructors in the Top-3 countries require a Ph.D., while the requirements in Denmark are for a Master’s degree. It is quite possible that this difference implies a difference in the instructors’ abilities to validate the materials employed in their teaching.

The content of the teacher education programmes in Denmark and Finland differs from that in Canada and Singapore in that the latter two countries employ teaching materials combining research-based professional knowledge with practical guidance and experiences while the former two countries keep these two types of knowledge separate. Indeed, particularly within the Danish teacher education programmes, teaching materials which make clear the importance of the bedrock of knowledge for practice are more or less absent. A possible explanation for this difference may be a tradition within Denmark and Finland for a clear division of labour between the teaching of theory, which takes place at the educational institution, and the teaching of practice, which takes place at practice schools. In Finland, these practice schools have specially trained supervisors, which was also true in Demark until 1987. Even though practical training also forms part of the teacher education programmes in Canada and Singapore, teaching materials are used which not only examine the theoretical foundations of, for example, differentiated teaching, but which also indicate organisational and management strategies and provide extremely concrete ‘how-to-do’ instructions for the planning, performance and assessment of teaching. As a result, student teachers in these countries are presented with actual planning tools, teaching materials, and narratives about successful practice. In other words, both theory and practice are dealt with at the educational institution. It must be assumed that combining theory and practice in this way within the teacher education programme provides a more solid foundation for the students’ activities during their practical training.

Another difference between, on the one side Denmark and Finland, and on the other side Canada and Singapore is apparent in that, especially within the Danish teacher education programmes, but also the Finnish, a quite extensive body of philosophically-oriented literature is included. This literature is largely of an ideological and normative nature and places great emphasis on educational theory (Bildung). This type of literature is not found within the teacher education programmes in Canada and Singapore. One explanation is found against the backdrop of an alignment in Denmark and Finland with a continental European, and particularly German, tradition of didactics, while Canada and Singapore embrace a more empirically-oriented Anglo-American tradition.

However, a second explanation for this disparity might be the difference between so-called ‘old-world’ countries like Denmark and Finland and ‘new-world’ countries like Canada and Singapore. The ‘new world’ countries can be characterised as forward-looking. Students’ lives have not been predetermined by their origin, i.e. sources of self-identification such as name, age, family, social status or profession – as has largely been the case in the ‘old world’ countries. In ‘new world’ countries, as characterised by immigration and/or nation-building, identity is not determined to any notable extent by the individual’s past: identity is, as a matter of course, something the individual must create him or herself. In the ‘new world’ countries, individuality is primarily linked to *how* you are, and not so much to *what* or *who* you are. Educational efforts are therefore towards the development of the individual student’s potential, or in the case of Singapore, towards an ability-based and aspiration-driven school system ([Ministry of Education Singapore, uå.](#_ENREF_12)).

When it comes to the ’old world’ countries, it can be said that they are in the midst of a transitional phase, from class-divided industrial societies to complex, functionally-differentiated societies where the traditional sources of identity formation still play a part, but no longer suffice as it becomes ever more apparent that children’s lives are far from entirely predetermined by their origins ([Schelsky, 1957](#_ENREF_18)). As such, the ‘old world’ countries find themselves in a situation where it would be to their advantage to learn from the ‘new world’ countries, and where educational theory and practice in the ‘old world’ countries is in the process of adapting from an orientation towards students’ origins to an orientation towards their futures.

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1. In Finland the collection of teaching material took place in co-operation with a Finnish speaking Ph.D.-student at Department of Teacher Education, University of Helsinki. Teaching material in Ontario as well as in Singapore is in English language. [↑](#footnote-ref-1)
2. Johan Friedrich Herbart introduced a distinction between three ‘circles’ of pedagogy, as early as 1802 in his lectures on education. This distinction is highly reminiscent of that applied by Durkheim roughly 100 years later, namely pedagogy as science, pedagogy as education in the art of teaching, and pedagogy as more haphazard educational relationships ([Herbart, 1887, s. 284](#_ENREF_9)). [↑](#footnote-ref-2)
3. The report ([Tetler, Hedegaard-Sørensen, Mørk, & Ulvseth, 2012](#_ENREF_2)) presents the findings of a comparative study of content in the special education subject in teacher education in Denmark, Finland, Ontario, and Sweden. The study applied the same search categories as those invented in the study reported here, and it confirms the findings of this study. [↑](#footnote-ref-3)