

Teacher education and final thesis: A common but diversified Nordic Context

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The final article in this special issue summarizes how different models or approaches to the final thesis are implemented in five Nordic countries and Germany. First, an analysis is offered on the major themes featured in the preceding articles, such as the “universitisation” or academization of teacher education, the discourse on quality of teachers, and variations and tensions in relation to the aim and positioning of the potential final thesis in teacher education. How the final thesis contributes to student teachers’ professional development is then critically discussed, and implications for future practices are offered.

Keywords: Teacher education, final thesis, Nordic countries, research-based teacher education, comparative study

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Introduction

The articles in this special issue explore the overarching question of how student teachers should be prepared for the teaching profession, focusing on the possible existence and organisation of what is often referred to as a “degree project” or the “final thesis” in teacher education as a case for analysis. A degree project or final thesis can have other names in different countries, such as a dissertation, thesis, research project, or paper (Råde, 2014), which makes the task for analysis and comparison somewhat difficult.

For the papers in this special issue, the authors were asked to write about what characterizes the final thesis, its orientation and organization in their own national context and teacher education. We were interested in exploring the models of final thesis writing and what commonalities and differences that can be identified across the Nordic countries and Germany. The authors were also asked to establish a background on teacher education to discuss their national and/or local orientations on the final thesis, as well as provide an outlook for the future. The implementation of the final thesis in teacher education programs in relation to the professional development of student teachers and research carried out on various aspects of the final thesis were also integrated into the analysis of cases in each respective country. We didn't want the contributions to be strictly formulaic in their writings, as different emphases and concerns outside of their own context might emerge. The aim was to make this special issue informative, interesting and insightful to all stakeholders in teacher education, by focusing on how different models or approaches to final theses are implemented and how they contribute to student teachers' professional development.

This final article thus delves into some interesting themes featured in the contributions in this special issue on the final thesis in the Nordic countries, supplemented with a case from Germany as a view “from the outside”.

The interest in the issue of the final thesis was triggered by the fact that teacher education has been the focus of heated debates, substantially restructured in many countries in recent times, and lately subjected to intense scrutiny as part of the discourse on teacher quality (Mayer, 2021; Moon, 2016). This is also the case in the Nordic countries, where teacher education models in general differ from models in other parts of the world (Blossing et al., 2014; Hopmann, 2008), as well as differing in quite important and interesting ways between each other (Elstad, 2023; Furuhausen et al., 2019; Krejsler, 2023). This is interesting since education in schools in the Nordic countries has a distinctive model of an extended, inclusive, comprehensive, and undifferentiated model valuing equality and not streaming pupils in the educational system until the age of 15 or 16 (Elstad, 2023), contrary to, for example, Germany. Elstad relates the commonalities in school models to the social-democratic Nordic society model, and among other things, free education at the primary, secondary, and tertiary level (Elstad, 2023; Krejsler, 2023; cf. Esping-Andersen, 1990). However, each Nordic nation state governs its own schools and teacher education, but supranational influences, e.g., “policy borrowing” or “policy lending” are currently strong, starting in the 1980s (Krejsler & Moos, 2023). These influences have given rise to dominant trends in education policy, such as the OECD's Program for International Student Achievement (PISA), the discourses of “best practice,” and tensions in educational systems (Elstad, 2023; Portnoi, 2016; Silova et al., 2020). The recent neo-liberal education policy brings about new challenges in the Nordic educational systems. Blossing et al. (2014) state that the earlier dominant

discourse on “a school for all” is dead and no longer a part of the rhetoric in the Nordic countries. Education systems are instead forced to take part in the competition to produce the quality measures necessary in a competitive and global economy (Langelotz & Beach, 2024; Pulkkinen et al., 2019). This, of course, has consequences for defining what constitutes an “excellent teacher” and how teacher education should be organized for promoting professional development in line with this definition.

Going a bit back in history on teacher education, Cochran-Smith and Fries (2005) argue that teacher education was first conceptualised as training, then as learning to teach, and more recently, teacher education has been framed as a policy problem, often with ideological undertones (Moon, 2016). These tensions on professional and academic learning, between relevance and rigor, seem to never end, as Elstad concludes (2023). This is obvious in the contributions to this special issue, where questions on the weighing of practice and how to create a balanced and effective teacher education are recurrently discussed in all Nordic countries.

The academization of teacher education

In the first paper by Yildirim et al. (in this issue), various views or paradigms on teacher education consisting of assumptions, goals and principles, as well as the final thesis orientations, are explored and set the tone for this special issue. The following country case studies explore respective trends, policy decisions, program characteristics and research results on the final thesis in teacher education in the five Nordic countries and in Germany in line with these orientations. We can conclude from these articles that research-based teacher education has become the common model in the Nordic countries, as well as in most European countries (Krejsler, 2023; Krejsler & Moos, 2023). This seems above all due to the transnational Bologna process and agreements, which acted as a convergence force and brought significant coherence to higher education systems across Europe at the end of the 1990s (Pires Pereira et al., 2021).

Among the Nordic countries, Finland was the first to transfer all primary and secondary school teacher education to universities in 1971. The aim was to unify different teacher categories and make all teachers familiar with the latest research in academic subject matter and pedagogy (Niemi, 2016a). Teacher certifications in Finland have been awarded through master's degrees consisting of five-year university programs since 1979 (Niemi, 2016a; Niemi & Jakku-Sihvonen, 2011). The transfer of teacher education into universities followed in Norway in 1975 and in Sweden in 1977. Teacher education in Iceland was transferred to universities in 1998, also involving the merging of four teacher training institutions to form the Iceland University of Education. Later, in 2008, the Iceland University of Education merged with the University of Iceland. New legislation was passed in Iceland on teacher education, requiring a master's degree as a prerequisite for teaching certification for all school levels from preschools to upper secondary schools (Sigurdardottir et al., 2018). Sweden has teacher education programs comprising between 90 and 330 credits: however, not including studies on master's level. Currently one higher education institution in Sweden, has recently started to allow subject teachers the opportunity to obtain a master's degree in education.ⁱⁱ

This trend, named the *universitisation* or *academization trajectory*, relates to an adaptation of educational programs to academic standards (Menter, 2018). Finnish teacher education, which was as mentioned above, the first to transfer its teacher education into the university system, has been viewed as a model to compare with for teacher education in several countries (Darling-Hammond, 2017). Finnish teacher education has undergone very few reforms since the 1970s and is characterised by conventional academic ideas, forms and stability as discussed by Maaranen et al. in this issue. The authors confirm that the Finnish research-based teacher education has been acknowledged and even praised globally, but they also raise critical issues in their article and ask whether the research-baseness nature of the Finnish teacher education is more rhetoric than reality.

In contrast to Finland, the Swedish education system has undergone numerous reforms over the years, which have impacted teacher education programs. These reforms often aim to address various educational challenges but have led to instability as programs are continuously adjusted (Beach et al., 2014; Åstrand, 2023). The Swedish teacher education programs are currently becoming more diverse, on the one hand, five-year programs concurrently addressing subject area and pedagogical courses and on the other hand, an employment-based route (KPU), which is a new and shorter supplementary pedagogical education that comes on top of an undergraduate education in a subject area (Elstad, 2023). Denmark, in turn, has a four-year bachelor's degree, the "Professional Bachelor" in teacher education, which is markedly different from the other Nordic countries (Elstad, 2023). Thus, teacher education programs have in all Nordic countries been transferred to universities, except for Denmark, to integrate more academic and research-oriented elements into teacher education programs. The academization also involves rigorous quality assurance processes to ensure that teacher education programs meet high academic standards. This includes regular evaluations and updates to the curriculum based on the latest research findings (see for example Sato & Abbiss, 2021).

Moreover, as argued by Krejlsler (2023), teacher education policies and programs in Nordic countries have been increasingly affected by involvement in international and transnational collaborations like the OECD's PISA (Programme for International Student Assessment) and the IEA's Progress in Reading Literacy Study (PIRLS) and Trends in Mathematics and Science Study (TIMSS).

An overall impact of teacher education in the Nordic countries has been observed in the programs as the courses have become more academically oriented, and scientific research has been integrated into the process of teacher education through various processes, including the final thesis. Although Denmark has not followed this track in transforming teacher education programs, a research-based approach has influenced teacher education courses and how the final thesis is positioned in relation to the education of future teachers.

Discourse on quality and research-based teacher education in the Nordic countries

A common understanding of the teaching profession as having become more complex and needing a stronger educational base was prominent in the early 2000s. As an example, the report entitled *Teachers Matter. Attracting, Developing and Retaining Effective Teachers* (Organisation

for Economic Cooperation and Development [OECD], 2025) with a focus on teachers' impact on students' achievement, argued for the importance of strengthening teacher education in general and teachers' research-based competence more specifically (cf. Cochran-Smith & Lytle, 1999; Jakhelln et al., 2016). In the Nordic countries, a research-based teacher education refers to a model of teacher preparation that integrates academic research, critical inquiry, and reflective practice into the core of teacher education programs. This approach is deeply rooted in the belief that teaching is not just a craft but a profession that requires a strong foundation in educational theory, research methodology, and evidence-based practice (Fiskum et al., 2025). The requirements for a research-based approach led to the extension of primary teacher education programs in some Nordic countries from a three-year bachelor's program to a five-year program, ending with a master's degree, manifested in a 30 ECTS final master's thesis. This extension of teacher education took place in both Iceland (Sigurðsson et al., 2023) and Norway (Aakre, 2022). The purpose of these extensions was to create a closer connection between research/theory and practice in teacher education, with the idea that this would strengthen teachers' knowledge base, enhance the academic quality and foster innovative teachers (Askling, 2006; Churchward, 2022; Darling-Hammond, 2017; Munthe & Rogne, 2015; Åstrand, 2023).

Accordingly, a master's level teacher education program was introduced as an integrated program in Norway for grades 8-13 in 2003 and for grades 1-10 in 2017, and in Iceland in 2008. In Finland, a research-based teacher education ending with a master's thesis was already in place since the 1970s, as mentioned above (cf. Darling-Hammond, 2017). However, other models also exist. In Sweden, primary teacher education includes four years of study. A final thesis was introduced already in the 1992 reform and has become increasingly extensive, currently including a final thesis of 30 ECTS or two theses of 15 ECTS¹ each (Prop. 2004/5, p. 162; Råde, 2016). In sum, we see that teacher education in the Nordic countries is research-based but differs in length, focus and understanding of the underlying approach (cf. Jakhelln et al., 2019). Moreover, a research-based teacher education needs to be grounded in course content and several other aspects to be validated as thoroughly research-based as argued by Alvunger and Wahlström (2018). They concluded from research on Swedish teacher education that while the content of teacher education is described as research-based, the students rarely encounter original and first-hand research. Also, a study by Munthe and Rogne (2015) using teacher education institutions in Norway as a case, reinforces the perception that teacher education programs vary in giving students a research-based education, due to contextual factors such as the teacher educators' own experiences of and research opportunities.

Final thesis – variations and current developments

The intention of the final thesis in primary teacher education programs in all the Nordic countries is to meet both scientific and professional objectives, and the construction of the final thesis in all teacher education policies, albeit to varying degrees, can be categorized as

¹ECTS stands for the *European Credit Transfer and Accumulation System*. It is a standardized system used in higher education to facilitate the transfer and accumulation of academic credits across European institutions. See: European Commission, <https://education.ec.europa.eu/>

“research-based” or “research-engaged.” We can, however, based on the articles in this special issue, note that there are nuances in emphasis and focus concerning the interpretations of the final thesis goals, organization and implementation. This is partly attributable to the specific teacher education paradigm, or to the interpretations of this paradigm upon which the courses are constructed (Healey & Jenkins, 2009; Yildirim et al., this issue), as well as to the conceptualization of the final thesis and its various existing models.

Starting with Danish teacher education, we can immediately state that teacher education is a deeply contested field within education. Danish teacher education is presently engaged in a process of reform, and a new teacher education LU 2023², is being implemented. From August 2023, increased teaching hours, extended internship periods, enhanced guidance, and a curriculum emphasizing practice-based teaching have become the major characteristics of the new teacher education programs. These changes were designed to improve the quality of teacher education, encourage more individuals to pursue a teaching career and to reduce drop-out rates in teacher education (Eurydice-Denmark, 2024; Matache, 2022). Lund Nielsen, in this special issue, describes the tensions in the Danish teacher education and the pendulum swing that has taken place at different times between the weighing of theory, research and professional practice, which is not uncommon and is also described in international literature. Lund Nielsen draws attention to the “Danish tradition” from N. F. S. Grundtvig³ and his educational ideas that have deeply influenced education in Denmark, e.g., his “education for life philosophy” (cf. Hancks, 2024). Currently, Danish teacher education is a four-year integrated bachelor’s program (240 ECTS), ending with a thesis that was introduced in 1997. Changing reforms have influenced the orientations of the thesis, which now, according to Lund Nielsen, seems to be dominated by a “professional inquiry” orientation (Yildirim et al., this issue).

Finnish teacher education was the first to change its teacher education to a master’s level research degree, provided at universities and embedded in the university structure (Wollsheid & Opheim, 2016). Research activities are included in all parts of the program; students take courses in research methodology and attend a research seminar during their thesis writing to learn formal research skills (Maaranen et al., this issue). The teacher education program, as well as the master’s thesis (30 ECTS), is described as embedded in traditional academic ideas and forms characterised by stability (Maaranen et al., this issue; cf. Alvinger & Wahlström, 2018; Jakhelln et al., 2019). Several researchers conclude that the Finnish teacher’s education provides both a thorough orientation in pedagogical theory as well as a qualified preparation for the teacher to be able to research their own work (Askling, 2006; Niemi, 2016b). However, Finnish teacher education is not exempt from problems such as an emphasis on research has meant that lower priority has been given to teach in practice, for example during the student teachers’ work-based training in schools. Moreover, the

² LU 2023, *En ambitiøs læreruddannelse tæt på folkeskolen og til gavn for folkeskolen*. <https://www.folkeskolen.dk/her-er-aftalen-laererruddannelse-med-lokal-og-professionel-frihed-skal-hoejne-fagets-status/> (Retrieved 2026-02-16).

³ Nikolaj Frederik Severin Grundtvig (1783–1872) was a multifaceted Danish citizen. He held various roles: pastor, author, poet, philosopher, historian, teacher, and even politician. His influence on Danish history is profound, particularly in shaping a new form of nationalism during the latter half of the 19th century. Grundtvig’s philosophy is deeply rooted in national literature and spirituality (<https://www.britannica.com/biography/N-F-S-Grundtvig>).

concept of “teacher as researcher” is claimed to be unclear to student teachers and there is a growing number of dropouts of newly qualified teachers. There seems to be a discrepancy between the strong research emphasis in teacher education and the reality that student teachers encounter later in their professional practice. Thus, there’s a concern that the academic and research-based approach may sometimes be too detached from the practical realities of classroom teaching (Säntti et al., 2023). Yet, as argued by Hansén et al. (2023), there are few critics of the research-based Finnish teacher education linked to a master’s degree, “but a good education can always be made better” (p. 174). Earlier research by Hansén et al. (2012), points to four dilemmas in Finnish teacher education and argue that these are basic problems in many teacher education programs, and thus important to discuss when doing comparisons, and perhaps thereby “make teacher education better” (pp. 1-17). These dilemmas consist of (1) the organization of teacher education in higher education institutions and its internal organization, (2) the relationship between general and subject-specific didactics, (3) a research-based approach versus practice-oriented approaches, and (4) the transition from education to work (Hansén et al., 2012, p. 3; cf. Eklund, 2014). In our work with the final thesis, we see some of these dilemmas having a bearing on the implementation and organization of the final thesis in all Nordic countries, as well as in the case of Germany.

The Icelandic teacher education has, as evidenced by the article by Ragnarsdóttir and Jónsdóttir (in this issue), changed gradually into a research-based teacher education introduced in 1997/98. Since 2004, there has been an emphasis on linking research to practice, following standards in the Bologna agreement, with opportunities for specialization and ending with a five-year teacher education and a master’s thesis introduced in 2008. Research should thus be interwoven into all courses in teacher education where students read and interpret research articles and have diverse research-related assignments and discuss their findings. However, and again, new legislation came into place in 2020, due to low interest in teacher education since the introduction of the master’s exam, as well as teacher shortage and extensive drop-out from teacher programs. A new master’s program was introduced, finishing with a degree called Master of Teaching (MT). In this program, the master’s thesis has been offered as optional, and student teachers can choose between different types of thesis projects in exchange for writing a traditional, empirical research study. Such projects could include constructing teaching material, creating curriculum, developing a project or creating a plan for a concrete school development project. These new alternatives have attracted more student teachers to enroll at the master’s level and seem drawn towards the Master of Teaching programs. This raises naturally questions on the research-base of teacher education and the balance between research and practice (Ragnarsdóttir & Jónsdóttir, in this issue; cf. Sigurðsson et al., 2023).

The Norwegian teacher education has undergone several reforms over the last decades, changing from a broad, more practice-based teacher education to a research-based education provided at the master’s level. This development can be characterised as a paradigm shift in the Norwegian context. A five-year master’s program, ending with a master’s thesis, was implemented in 2017 in teacher education grades 1-10 in the national strategy named “Teacher Education 2025”. The teacher education programs should be “integrated, profession-oriented and research-based” according to the policies, expressed not the least in relation to the final thesis and operationalized by the two concepts *research-based* and *profession-oriented* (Lorentzen & Afdal, in this issue). However, as argued by Lorentzen and Afdal (in

this issue), there is no clear description of how these two concepts should be operationalized in the final thesis. Lorentzen and Afdal argue that different types of teacher education programs have slightly different orientations, and the final thesis is positioned in these programs with varied requirements and expectations. There are questions related to what forms of knowledge is (or should be) mobilized through the final thesis work. Should the final thesis work emphasize didactics, pedagogy or disciplinary knowledge in relation to school subjects? In relation to issues of the concept of research-based teacher education, Lorentzen and Afdahl find that there is a common understanding that the final thesis should be “somewhat relevant,” but the question of who considers it to be relevant remains unclear (Lorentzen & Afdal, in this issue). The response to these questions seems to be somewhere in between the professional development needs of teachers and the research-based nature of the teaching profession. It seems to be the old dilemma of the theory/practice dichotomy that still hasn’t been solved.

When turning our gaze to Sweden, we note that teacher education was transferred into the university system in 1977 and a final thesis work was introduced in 1992 (Nyman et al., in this issue; cf. Råde, 2016). Swedish education has, like many teacher education programs, gone through many changes in recent years with short time intervals (Beach et al., 2014; Åstrand, 2023). Moreover, since 2010, the Swedish Education Act for Schools stipulates that education shall have a *scientific foundation* and *be founded on proven experience* (SFS 2010:800, 5). Sweden was the first country in the world to include such clear stipulations in its Education Act for schools and their professionals, thus putting greater demand on teachers (Bergmark & Hansson, 2020; Larsson & Sjöberg, 2021). The concepts of *scientific foundation* and *being founded on proven experience* were, however, framed in a rather vague way in the Education Act and were therefore left to education authorities and actors at the school level to decide how to enact it in practice (Rapp et al., 2017). What was defined by the Swedish National Agency for Education as scientific knowledge was “theoretical rooting, elaboration and development, as well as an empirical basis,” “proven experience” and “teacher knowledge that is tried and tested collegially, and documented” (SNAE, 2020). Accordingly, current research demonstrates the complexities in policy enactment as teachers and principals try to implement this policy (Lundqvist & Westerlund, 2022).⁴

Even if a final thesis has had a place in teacher education for a long time in Sweden, the final thesis has gained an increasingly important place as final theses have been used to examine the quality of teacher education programs as such. The final thesis has also expanded in line with the Bologna Principles (Nyman et al. in this issue). In their study, Nyman et al. found that all Swedish syllabi on the final thesis had formulations in relation to subject knowledge, e.g., an academic orientation, while about half of the syllabi also stressed the professional relevance. This, of course, raises questions, as commented by Nyman et al., on the use of theories and theoretical frameworks of final theses in teacher education. Interestingly, in a large-scale study of final theses on teacher education in Sweden between 2005 and 2023, with approximately 130 000 theses work, Skau et.al. (2025) found a large variety of topics but similar methodology. The most common methods were interviews, which were

⁴ Gert Biesta (2007) discusses critically the issue of “evidence-based practice” in his article “Why ‘what works’ won’t work: Evidence-based practice and the democratic deficit in educational research”

used in approximately 47 percent of the cases, whereas the use of surveys accounted for ten percent. There was, however, an increase in the topic areas, including special education, multiculturalism and citizenship, and relational pedagogy.

In sum, we see that teacher education in the Nordic countries is positioned as research-based or research-engaged teacher education programs. Teacher education has merged into universities and into the structures of higher academic education. One of the key features in Nordic research-based teacher education is the final thesis, which has been successively introduced and is increasingly important in line with the Bologna process and the academisation of teacher education. An emphasized aim is to promote analytical and critical thinking and reflection, encourage student teachers to synthesize academic and professional knowledge and objectives and continuously develop their own practice (Råde, 2018; Hansén et al., 2023). The final thesis is sometimes described as the hallmark of the research-based professional ideal (Westbury et al., 2005). There are, however, tensions and challenges in relation to the final thesis in all Nordic countries. We will come back to this issue later in this article, but at first glance of the structure of the final thesis in Germany.

With a glance towards Germany

In this special issue, we have also incorporated Germany's teacher education orientations in general and the implementation of final theses in teacher education programs more specifically within the context of one federal state. Comparing teacher education in the Nordic countries with Germany's teacher education is particularly interesting for several reasons. Although the Nordic countries and Germany have similar socio-economic conditions, there are significant differences in education systems. These differences can be traced to historical, cultural and political factors that have influenced the design and decision-making of education. By comparing the goals and objectives of teacher education in different countries, we can better understand how they prepare future teachers for the profession (Tatto, 2023).

In Germany, teacher-training policy is the responsibility of the 16 federal states' own education authorities. Because of this, programs of study in the different federal states can vary in structure and content, particularly regarding the number, range and combinations of school subjects in which teachers are trained. However, there is a marked difference between the teacher education programs for primary and secondary school systems (Drahmann, 2020). This division into differentiating and hierarchizing school types, which is not the case in the Nordic countries, is underlined by the authors for the German case. The German school system is unique in Europe as it sorts students into different educational paths early on. This is a hotly debated issue, especially following the PISA shock in 2000 (Davoli & Entorf, 2018). The differentiation into school types has obvious effects on teacher education programs.

The degree program in primary education, or 'L1' as it is known, prepares students to teach years 1-4 at German Grundschulen. Graduates get a teaching certificate for years 1-6 in their teaching subjects. For secondary and upper-secondary teaching, the teacher training program is divided into a first academic phase at university (3-5 years) followed by an in-service training phase (1.5-2 years) run by the respective state's education authority (Cortina & Thames, 2013), largely adapted to the requirements of the Bologna agreement, thus including bachelor's and master's degrees. In the in-service training phase, teachers

work in school classrooms under partial supervision and gain practical experience, observe experienced teachers, and gradually take on teaching responsibilities themselves. Teacher education in Germany can clearly be categorized as research-based since the 1970s, and student teachers are required to write an academic final thesis as part of their studies. The specific requirements can vary depending on the university and the program. While the exact structure and content may differ, the process typically involves finding a topic, conducting research and presenting findings, which is in line with the concept of “research-based learning”, much used in the German educational discourse. For example, at the University of Oldenburg, where the contribution for this special issue was written by Spies and Gerheim, students must submit a master’s thesis with a scientific, goal-oriented, and practice-relevant approach at the end of their program.⁵ The master’s thesis in the teaching profession can be written either in educational sciences or in a teaching subject. However, Gerheim and Spies in this issue draw attention to the fact that there are limited publications on the topic of master’s theses in Germany, contrary to neighboring Switzerland, where the debate on the issue seems to be lively. Thus, the German authors urge for investigating the influence that writing master’s theses has on professionalisation in teacher education further.

Tensions and discussions regarding the final thesis in Teacher Education

The comparative discussion of the case studies above leads to several key issues that demand further discussion in relation to positioning final thesis in teacher education. These are discussed below.

How to bring research into practice and practice into research?

A research-based approach and balancing theoretical knowledge with practical teaching skills are topics of long-standing debates in teacher education, which is evident in several of the articles in this special issue. There are built-in tensions between subjects and interdisciplinary orientations and between an academic orientation and an orientation towards practice (Askling, 2006; Haugen & Hestbek, 2017). Research findings indicate that student teachers experience difficulties when applying the knowledge they gained in academic courses in practice; therefore, they sometimes feel that their teacher education program does not adequately prepare student teachers for their future profession (Eklund, 2014). The final thesis, some argue, is one way of synthesizing theory and practice, enhancing teachers’ professionalism and providing skills necessary for undertaking their own research in practice (Westbury et al., 2005). Eklund et al. (2019) conclude from their study in the Finnish context that the possibility of deepening one’s research within a chosen theme is perceived as positive by student teachers, but they are often critical of the concrete benefits in terms of teachers’ teaching and professional work. Questions about the choice of the research topic and how this can be made more relevant to teachers’ future practice are raised, and how student teachers might further use research literacy in their teaching in practice.

One way of positioning research in practice could be creating further opportunities and venues for sharing final thesis findings with teachers in practice. Presentations of the

⁵ See: <https://uol.de/en/students/exams/theses>

findings to the teachers in schools and disseminating summaries through teacher journals or web pages might be examples of such opportunities that could be created through collaboration with schools and educational authorities. In addition, student teachers might be encouraged to carry out research with their mentor teachers in schools so that problems can be selected from real educational contexts, which might increase the likelihood of bridging research results with practice in schools. Such initiatives are discussed in the contributions from both Finland and Norway. As the dissemination of knowledge from the thesis to school practice in teacher education has long been a central concern, the issue of dissemination is important. Traditionally, the focus has been on linking practice to theory. Teachers learn theories and then apply them in the classroom. More recently, attention has shifted to the possibility of linking theory to practice. This involves grounding theoretical concepts in classroom realities. Programs that facilitate interaction between university faculty and teachers could foster shared knowledge and instructional methods, something that the work with the final thesis could better use and further develop (Korthagen, 2010; Resch & Schritteser, 2023).

The final thesis - a process and/or a product

Several recurrent discussions about the final thesis deal with the assessment of student teachers' written work. There are also ambiguities among examiners and supervisors about whether the glints and pieces of the writing process students are going through to produce the written product should and even could be assessed and marked with grades. Several universities develop differentiated grades for the products students write, in the form of criteria that are available for students as a sort of extended guidelines for how to perform the thesis writing. A recent study found three profiles of what to evaluate in the final thesis work amongst a group of examiners in teacher education (Stolpe et al., 2021). The three profiles were named *Logic text structure as product*, *Research process as product* and *Results as product*. These profiles explain altogether 58 percent of the total variation in the data, where *Logic text structure as product* explains 22 percent, *Research process as product* explains 20 percent and *Results as product* explains 16 percent of the variation. The same interviewed examiners found the logic structure of the final thesis' text or the research process students had done to be the most important for a text. Somewhat fewer examiners found that what students presented as results of the thesis writing was the most important thing to evaluate.

Two of the texts in this special issue particularly touch upon the discussion about process and/or product as two components of what could and/or would be components in student's thesis writing. Lorentzen et al. (in this issue), in their analysis of final thesis in Norway, point at the amount of autonomy for students in the process of choosing topics and influence the process of writing as either an empowering or a restricting factor. They also find whether the programs emphasized process vs product in the course organization as more or less enabling students' autonomy.

Maaranen et al. (in this issue) describe the support from the university in the form of a supervisor and the infrastructure the students should learn to use in the process of writing their thesis in two Finnish universities. Thesis writing in Finland is considered important as a part of the master's program that student teachers are obliged to complete to become a

teacher. Several things that support students in their writing process is described in the Finnish article (Maaranen et al. in this issue), as clear frames for students' and supervisors' roles in the writing process, as well as the rigor of data collection from ethical standpoints and special advice of writing academic texts. In the assessment process of Finnish theses, there are transparent criteria for what should be found in the thesis, as specific parts and rubrics with content. There are also specific rules of how examiners are chosen in relation to topics and students to guarantee the quality of the published student report.

Supervision and students' agency

Supervision plays a crucial role in guiding students through the process of writing their final thesis, and supervisors' written feedback is a powerful pedagogical tool in this process. Effective communication between supervisors and students is essential for successful thesis writing as well (Nurie, 2018; Ädel et al., 2023). However, research shows that little is known about the specific information supervisors focus on and the language functions they use to communicate with students (Nurie, 2018; Pokorny & Pickford, 2010), and there are contradictory demands and a broad repertoire when it comes to the roles attributed to supervisors as well as students shown at least in research from a Swedish context (Råde, 2018; Ädel et al., 2023).

Furthermore, the critical academic tradition in teacher education is in some of the Nordic countries rather weak, and the students in general are not well prepared for this kind of work as a future teacher (Ahlstrand, 2002). Parts of these conflicting demands and complexities are discussed in the articles in this special issue, where supervision and student teachers agency in their thesis work seem to be similar and to some extent different. Thus, student teachers in most Nordic countries, as well as in Germany, are guided to write a research-based thesis, most commonly as a self-chosen empirical research project, and student teachers seem to have a major influence on the choice of topic, methods and implementation. There are, however, general regulations that the thesis should relate to a problem in teaching and learning, such as classroom processes, and contribute to teachers' professional development. The time allocated differs depending on whether it is a bachelor's or a master's thesis. The supervision also differs, for instance, in the German case the master's thesis is supervised by two lecturers, one of whom must be a full professor, which is not the case in all Nordic countries.

In a study by Kowalczyk-Wałędziak et al. (2019), a question was raised regarding whether writing a thesis as a student teacher is "meaningful use of time" for their professional development needs or "waste of time" because it is an "unrealistic" expectation for student teachers given their limited time for carrying out such research. This question was also asked by the same researchers in Poland, Portugal, England, Latvia, and Romania. The overall answer given by the respondents who were the teachers in schools was "yes" but also reflected a "hesitance" regarding the use of the final thesis for professional development. Student teachers valued the impact of the final thesis on their professional development, personal development and growth, and understanding of the relationship between research and practice as positive, while they were less confident about the use of the master thesis' research findings in their (future) workplaces. These concerns are also reflected in all the case studies in this special issue to varying degrees. Although research-based teacher education

appears to be a clear goal in all countries analyzed in this issue, there seem to be major differences in the requirements and expectations for final thesis for student teachers' professional development. However, when exploring the relations constructed between final thesis work and student teachers' future professional practice, Lorentzen (2025) lists four reasons why student teachers' thesis is valuable as perceived by the informants in her study: developing research competence, connecting theory to practice, fostering professional reflection, and contributing to school development. Lorentzen especially emphasizes that the process-oriented perspectives of thesis work should not be overlooked when discussing its value. This requires, of course, that the final thesis work takes place in a creative environment with professional support.

Conclusion

We now return to the initially posed question for this special issue, namely, on how students are prepared for the teaching profession in the Nordic countries and Germany, especially focusing on the possible existence and organisation of the final thesis. In this summary article, we notice that teacher education programs in the Nordic countries, as well as in Germany, are overall positioned as research-based or research-engaged teacher education programs, however, with inherent tensions. There is *inter alia* varied emphasis on the knowledge base of research literacy, i.e., on the ability to access, interpret, and critically evaluate primary research literature and carry out a research study themselves. And, as for teacher education in Denmark, now moving back towards a practice-oriented approach and still something of an outlier in the Nordic educational landscape (cf. Elstad, 2023, p. 363). Also, Iceland seems to have adjusted the strict research-based master's thesis model introduced only about ten years ago to a new master's program, finishing with a degree called Master of Teaching (MT), where the master's thesis is optional. Instead, there are options for developing a teaching material or conducting development projects. A similar process seems to take place in Norway, where some teacher education institutions have introduced an entrepreneurial version of the thesis consisting of the development of a teaching material or a teaching intervention with a smaller thesis focusing on methodology and theoretical reflection on the innovation (Wågsås & Afdal, 2024, personal communication).

Anyone who studies the modern history of teacher education finds highly varied and conflicting opinions about teacher education, in this issue shown through the different teacher education models discussed in the introductory article (Yildirim et al., in this issue). There are, and will probably always be, tensions, competing models and discourses concerning the organization of teacher education and how student teachers should be prepared. These are perennial questions, context-dependent and tied to values and politics (cf. Elstad, 2023). In the light of such contradictions, the status of a research-based teacher education, including a final thesis, is hard to predict.

The discussions around the final thesis in all countries in this issue do not center around whether there should be a final thesis in teacher education, but address issues on what we expect from the final thesis in relation to research literacy and professional development needs of student teachers. It appears that this discussion will continue in the near future, and research studies comparing teachers trained with different orientations will shed

light on the status of final thesis, and what it achieves in relation to the scientifically based teaching profession.

In line with this need, it is suggested that comparative longitudinal studies be undertaken with student teachers exposed to different final thesis orientations to investigate professional development gains of student teachers and how these gains are later used in schools when they become teachers. Both surveys and case studies might be relevant to understanding the trends among student teachers, as well as in-depth experiences of individuals both in carrying out the final thesis and how they put results into practice as teachers later in schools. Design-based research design might also be relevant for developing new models/for the final thesis and testing different models in small groups in relation to professional development gains among student teachers.

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