Chapter One

Teacher education: into the future in Norway and at NTNU

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Summary

Recent reforms have made the master level the new norm in Norwegian teacher education. The main study programs are now five year integrated master programs, whilst enrolling in the one-year practical teacher education program will generally require a master degree from 2019. The exceptions to the new norm of master are mainly pre-school teacher education and teacher education for vocational subjects in upper secondary education.

The newly established Department of Teacher Education (ILU) at NTNU is a result of a recent merger between two institutions providing different kinds of teacher education. The department aims to be at the forefront of national activity in developing the new and revised teacher education programs.

This chapter firstly gives a brief overview and interpretation of the current situation in Norwegian teacher education and in Norwegian schools. We focus on the teacher education study programs, rather than the expansion of in-service teacher education. Thereafter we discuss some possibilities and challenges for teacher education in Norway and at NTNU in the future. It is our view that NTNU is well positioned to meet these challenges.
1. The context

1.1. Recent changes in teacher education programs.

The understanding that teacher professional development needs strong education in pedagogy and didactics, and to be practice oriented, evolved around 1990. The PGCE program (PPU hereafter), building on traditional disciplinary study programs, expanded from a half-year to a full year study program from 1994. Teacher education for primary and lower secondary education expanded from three-year to four-year programs in 1992.

Following the Bologna process in 2003, Norway reduced the length of master degrees with PGCE from six years to five years. This has mainly been implemented as 3+2 program (three-year bachelor programs plus two-year master programs). During a reform period, the integrated teacher education program for secondary teachers (grades 8 to 13) was developed. In short, the program (hereafter LU 8-13) includes the same professional subjects as the one-year PPU (PGCE), but spread over the first four years of studies. The master thesis is the responsibility of disciplinary departments and is largely similar to a normal disciplinary master thesis. The candidates from these programs are qualified to teach in two subjects.

A reform in 2010 split the general teacher education program into two programs for different grade levels: one teacher education program for grades 1 to 7 (primary education), and another teacher education program for grades 5 to 10, denoted GLU 1-7 and GLU 5-10, respectively. The new programs require more specialization in specific subjects. The candidates are no longer qualified to teach every subject at school, but their competence within each of their chosen teaching subjects is more extensive.

By 2017, these teacher education programs had been expanded to five year integrated master programs. The students now need to specialize in one subject as their master subject, but will achieve overall competence to teach up to four subjects in GLU 1-7 and up to three subjects in GLU 5-10.

For enrolling into the one-year practical teacher education program (PPU/PGCE), a bachelor degree has been sufficient, until now. From 2019, it will be mandatory to hold a master degree, with exemptions for some relatively minor vocational and practical subjects. This change might substantially reduce the number of qualified applicants, and at NTNU we expect a reduction of between 50% and 70%.

2.2. Recent trends in primary and secondary education.

Norway introduced comprehensive schooling as early as 1920. When comprehensive compulsory education was extended to nine years for all pupils in the early 1970s, the move towards upper secondary education for all was underway. In 1994, a legal right was established to participate in upper secondary education for the first five years after compulsory education. It was felt that a majority of the pupil population should complete upper secondary education (Hansen and Maasterkaas, 2010). Political ambitions to increase the completion rate have been intensified over the last decade. Thus, to briefly assess the performance of Norwegian schools, it might be useful to look at completion rates.

At the introduction of entitlemen for upper secondary education, about 70% of the cohort were already completing upper secondary education. Subsequently, the completion rate has been relatively stable. Figure 1 below presents the completion rate within five years after enrolment (the legal right) for the latest cohorts with available statistics. The 'year' notation in the figure is the year of enrolment into upper secondary education.

This short chapter cannot enter into a thorough discussion of the potential causes of low completion and high rates of early school leaving. However, all available analyses point to skill levels at entry as the main factor. The students with the lowest achievement in the main subjects in lower secondary education are the ones struggling in upper secondary education. It is a general finding in the literature that student achievement depends strongly on previous achievement.

Learning builds on previous skills and is cumulative. The main factor in low achievement is lack of initial skills. Consequently, a lack of progress in the early years involves a high risk of later failure. One main point in this brief

![Graph showing completion rates over years](source: Statistics Norway)

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5. See also: nr. 18 (2001-2002, ch. 3), a White Paper to the parliament in 2002, summarizes the discussions and the reforms.

6. It is also possible to specialize in 'special education' and 'pedagogy for the teaching profession'.

7. In 1997, the school starting age was reduced from seven to six years, increasing the length of compulsory education to ten years.
overview is that maintaining performance throughout the school system is important for the individual child. Increased quality of teaching in primary education will strengthen student achievement in lower secondary education, enabling more students to complete upper secondary education.

The importance of education attainment can be illustrated in many ways. For example, it is related to participation in elections and to crime. In the national election in 2017, the turnout was 65% for eligible voters with only compulsory education, while the turnout was 80% and 90% for eligible voters with an upper secondary degree and a degree from higher education respectively. Likewise, a disproportionately high percentage of people committing crime comes from the lower part of the grade distribution in lower secondary education, and participation in upper secondary education reduces the probability of committing crime (Brugård and Falch, 2013).

The main challenge regarding dropout in the Norwegian education system is found in vocational study tracks, mainly because students enrolling in these have underperformed in lower secondary education (Falch et al., 2010). They are simply less prepared for upper secondary education. It is a challenge for teachers of these study tracks to reverse this trend by adjusting their teaching to this student group. This again points to the importance of the quality of teaching in vocational studies, which is a specific challenge for teacher education, to which we return in Chapter 13.

The future

Creating coherent content and structure across teacher education study programs.

While educational policy has considered the 13 years of primary and secondary education as a coherent whole over the last 20-30 years, teacher education has not. On the contrary, teacher education has been fragmented across the educational ladder, with overlap between very different programs for the lower secondary level. Also, teacher education has been distributed across different types of institutions (universities and regional university colleges).

The merger in 2016 between NTNU and the former Sør-Trøndelag University College (HIST), and the establishment of the Department of Teacher Education (ILU) in 2017, opened up new possibilities. The new department includes all major teacher education programs in Norway, except pre-school teacher education. This places NTNU in a unique position to develop a coherent approach to education for the teacher profession. At NTNU, the five year integrated programs GLU 1-7, GLU 5-10 and LU 8-13 are of similar size. All components of the GLU 1-7 and 5-10 programs are provided by ILU, and these programs qualify students to teach all the mandatory school subjects. A range of subject departments are in charge of the disciplinary parts of the LU 8-13 program, while the Department of Teacher Education provides the professional components, as explained above, including practice training.

There are many potential advantages that might be exploited in this new department. Firstly, students from the various study programs will meet at the same campus and will partly be taught by the same professors. This will contribute to better common understanding, both of the teaching profession and of the importance of teacher quality, throughout primary and secondary education.

Secondly, the department can explicitly develop and explain the differences between the study programs, and why these differences exist. One major example is that the required competence of teachers varies, depending on the age of the pupils. In short, the need to deploy caring responsibility is highest during the earliest years. Moreover, teachers in high school need more elaborate knowledge of the disciplinary subjects than teachers in primary education. However, a strong disciplinary base is important in both cases, albeit in different ways. One example is classes in Norwegian. In high schools, this includes, among other things, the history of language and literature, while in primary education it focuses more on teaching pupils how to read and write. Both cases require disciplinary knowledge, yet involve different aspects of the subject ‘Norwegian’. Consequently, cooperation with the disciplinary departments at NTNU may be more important in teacher education for upper secondary education, while the need to integrate didactics and disciplinary topics is stronger for the earlier years.

Third, in the future, several teacher educators at the department will teach on programs across the previous institutional borders, and the closest colleagues will be those within the same discipline who deal with its teaching across all relevant teacher education programs. The whole department will be open to cooperation with other parts of the university, creating the best opportunities to consider the optimal design of teacher education programs geared towards the various progression routes in schools.

Fourth, practice has strong similarities across all the teacher education programs. The two former institutions organized their practice training differently, based on limited systematic and research-based evidence. These systems have remained basically unchanged over a long period, despite an intensified focus on the importance of competence for lifelong professional development. The new department needs a coherent approach to practice that is research-based, oriented towards professional development for the students, and flexible in response to new developments.

Integrating disciplinary, didactical, pedagogical and practical skills

What kinds of skills are important for teachers? Obviously, they need pedagogical skills, such as relational skills, insight into various learning theories and knowledge...
about children and youth development. In addition, they need deep content knowledge about the subjects that they teach.

Recent research points to the importance of skills in the subject(s) that the teacher teaches (Hanushek et al., 2014; See Falch and Mang, 2015, for an overview of the literature). Hanushek et al. (2014) use an international comparative test of skills in the adult population, the OECD PIAAC database. In a subsample of teachers, they found that in countries in which the skills of the teachers are (relatively) stronger in literacy than in numeracy, the students perform much better in reading than in mathematics on the PISA test, and vice versa. Students’ relative performance across subjects is therefore strongly related to the relative strength of teachers across the same type of skills.

The obvious implication of such a finding is that student teachers’ knowledge of the subjects they are going to teach in schools is important. For instance, in order to supervise pupil learning in biology, the teacher also needs comprehensive knowledge of biological issues. Teacher education therefore needs to focus explicitly on disciplinary skills. In turn, this requires that teacher educators are also highly qualified within their respective disciplines.

In addition to disciplinary skills, however, teachers must be able to teach their subjects using a variety of teaching methods, to a diverse range of pupils and at different levels. In short, teachers need to be skilled in didactics. Didactics is often understood as the “why, what and how of teaching”, implying that the subject covers both discussions about (i) why different subjects should be taught, i.e., how to legitimise the subject, (ii) what the content of the subject should be, and (iii) how the subject can best be taught. Lorentzen et al. (1998) state that disciplinary didactics are all the reflections that can be connected to a subject and its teaching, and that these reflections can provide more knowledge about the nature of the subject and about how it can be learned, taught and developed. This is why the teaching subject in teacher education is not identical to the disciplinary subject, but rather is about integrating disciplinary and didactical skills.

This is important because future teachers will have to contribute to the development of their subject in schools. They need to be critical towards learning materials, the curriculum and current practices. For instance, teachers have been invited to contribute to the present development of new national curricula for various subjects in Norway. This is only meaningful if they are trained to critically discuss the nature of school subjects during their teacher education. Otherwise, they risk becoming uncritical executors of textbooks at their schools.

From the three aspects mentioned above, it is evident that didactic skills are not identical across different teaching subjects and educational levels. Rather, they are tightly connected to the disciplinary content of the teaching subject. In teacher education, these issues are addressed in disciplinary didactic courses. Disciplinary didactics comprises discussions about the nature of the school subjects, as well as the issue of how pupils can learn different aspects of these subjects, and how teachers can best adapt their teaching in order to fulfil this goal. In the various study programs, these division lines are drawn differently. GLU 1-7 and GLU 5-10 offer combined, integrated courses in disciplinary subjects and didactics. Conversely, LU 8-13 splits these between disciplinary departments, which provide courses in disciplinary content, and the Department of Teacher Education, which provides courses in disciplinary didactics.

The GLU-model is challenging for the scope of the content, in particular for subjects where a total of only 30 credits in a combination of disciplinary subject and didactics is necessary for teaching certification. In the LU 8-13-model, where the division across different courses reflects the stronger focus on disciplinary depth in high schools than in primary education, it is challenging to develop coherent didactic skills for student teachers. Common courses exist today across GLU 1-7 and GLU 5-10, but not across GLU 5-10 and LU 8-13, even though both programs qualify their students for teaching in lower secondary education.

**Building teacher educator competence**

The need for a diverse set of skills might create overwhelming demands for teacher educators and institutions. A teacher education institution needs strong knowledge in the relevant disciplines, the didactics of the relevant subjects, and of the working of schools and the teaching profession. This combination of research-based knowledge takes time to build, at the individual level and institutionally. Both former institutions had strong emphasis on these three knowledge needs of teacher educators, but there is a constant tension between developing different kinds of skills and, at the same time, spending sufficient time on teaching and relevant research.

It is, for example, not sufficient to complete a PhD degree and a post-doctoral position in a disciplinary environment. Once employed in a teacher education department, it is necessary to develop new skills, in order to carry out relevant teaching and research. In this regard, methods used include arranging observation periods in schools and engaging new teacher educators in didactic research projects. Conversely, teacher educators recruited from teaching positions in school, and who can therefore provide valuable experience from the classroom, will come up against the challenge of research-based teacher education programs. Such new employees must, therefore, develop their research skills.

Teacher education at master level must prepare the ground for lifelong professional development for its students. Teachers have to be critical towards, and reflect upon, their own teaching, and should be able to initiate change in schools, which implies that they need to keep up to date with relevant research findings. In order to build such competence, students must be taught by qualified
professors who themselves are engaged in research, and should complete master theses that are clearly research-oriented. The extension of GLU programs to master level will entail a large number of master theses being supervised at the department. Such supervision represents a new task for most staff members from the former institutions, which specifically requires knowledge about research processes.

The challenge of developing the mixed skills needed in a teacher education institution is related to a weak tradition of PhD education in teacher education, both in Norway and internationally. In order to address this situation, NTNU established the PhD program “Research with focus on teacher education and school practice” in 2009 (See chapter 19). In the future, due to program reconstruction at the faculty, the relevant program will be called “Teacher profession and school research” within the PhD program in “Educational sciences”. This PhD program can be viewed as cross-disciplinary, since didactic research needs a context, typically a school subject and/or a teaching situation.

The historically low number of PhD candidates makes it challenging to recruit experienced staff to vacant positions within teacher education. Furthermore, because of the good job market for relevant PhD candidates, it is difficult to recruit to post-doctoral positions. Across Norway, there are vacant positions for individuals with a PhD in teacher education. Thus, it is necessary to substantially increase the number of PhD students in order to meet future needs. This kind of high-level competence is highly relevant, not only for academia, but also for schools.

One consequence of the mixed knowledge needs for teacher educators is that it takes considerable time and effort to be a “complete” teacher educator. This might make the teacher educator profession less attractive than other parts of academia, since it requires more personal investment and time in order to qualify for full professorship. The department must provide attractive possibilities to combine skills development, teaching and research. There is a danger that the competence needed for teacher educators comes at the cost of weak research conditions, and too little emphasis on research.

A possible alternative, given the scale of the research community in the department, is to allow some individuals to specialize in specific skills. Given that the community as a whole has strong competences in all relevant skills, some employees could focus more on the disciplines, whilst others work on subject didactics, or the working of schools and the teaching profession. The challenge for such an approach is to maintain an integrated focus on disciplinary content and didactics in the courses.

Summarising the challenges

The previous section points to several new possibilities and challenges for teacher education at NTNU that we briefly summarize as concluding remarks:

- Further develop a common understanding, at campus and within all teacher education study programs, of the teaching profession and all aspects of teacher quality across primary and secondary education.
- Further develop the integrated approach, including disciplinary, didactical and pedagogical skills, in all teacher education study programs.
- Further develop the competence of the staff, covering all aspects of knowledge in teacher education. It is particularly important to have research-based knowledge on current and upcoming challenges for schools, in order to educate teachers who are able to take the responsibility for their own lifelong professional development.
References


