Antecedents of student teachers' commitment to the teaching profession in Finland and Norway

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Abstract

The purpose of this study was to explore antecedents of Finnish and Norwegian student teachers' prospective commitment to work as teachers or pursue other careers. Are student teachers' perceptions of coherence between the theoretical and practical elements of the teaching programme related to their commitment to work as teachers or to pursue other careers? For Finnish student teachers, strong associations emerged between the theory-practice interaction in supervision and student teachers' prospective commitment to work as teachers. Norwegian student teachers exhibited strong associations between personalised feedback and their prospective commitment to teaching. Implications for practice and further research are discussed.

Keywords: student teachers, commitment, turnover intention, Finland, Norway

Introduction

Student teachers have expectations about their future careers as teachers when they start their initial teacher training. In theories about professions, students' experiences during their professional education are important for developing their professional identities and identification with the occupation (Freidson, 2001; Heggen & Terum, 2013). A student teacher's commitment to teaching is an expression of his or her future occupational identity, passion for teaching and professional expectations (Day, 2013). Conversely, we find turnover intention: the intention of a student teacher to leave teacher training or the teaching profession after completing the programme.

In most national systems, teacher education is a complex programme that requires a degree in an academic subject, such as mathematics, chemistry or physics, and pedagogical training, which directly prepares the student for teaching in schools (Darling-Hammond &

Lieberman, 2012; Lunenberg & Korthagen, 2007). In universities, these distinct elements are often in separate academic faculties and teacher education institutes. Pedagogical units provide training in the teacher's professional responsibilities and undertakings, while academic faculties provide training on subject-related courses (Elstad, 2010; Tamah, 2018). Teacher training consists of exchanges between campus courses for teaching subject didactics and educational theory and school practice courses for supervised teaching practice (Yılmaz & Çavaş, 2008). Several scholars believe that student teachers' perceptions of *coherence* between these exchanges are critical to prepare them for their roles as teachers (Tatto, 1996; Grossman et al., 2008). Coherence in teacher education, meaning "the degree to which central ideas regarding teaching and learning are shared by all the individuals involved in educating teachers and the degree to which learning opportunities are organised both conceptually and logistically toward those goals" (Grossman et al., 2008, p. 274), seems to be important for the development of professional identity (Heggen & Terum, 2013). Heggen and Terum (2013) believe that "coherence is the result of the practical relevance of the curriculum, the content and organisation of the education" (p. 659). Thus, our overall research question is: are student teachers' perceptions of coherence between the theoretical and practical elements of the teaching programme related to their commitment to work as teachers or to pursue other careers? Our study concerns teacher training in Finland and Norway.

Finnish teacher education is widely recognised as good quality (Tatto, 2015; Darling-Hammond, 2017). The Organisation for Economic Co-operation and Development (OECD, 2005) upheld Finnish teacher education as a good example for other countries to emulate. Norwegian teacher education programmes, by contrast, have been heavily criticised in expert assessments (Haug, 2008; Lid, 2013; Norwegian Agency for Quality

Assurance in Education [NOKUT], 2006; Panel for Teacher Education Reform, 2015). Consequently, the Norwegian Ministry of Education and Research has urged teacher education institutions to improve their quality of instruction (Norwegian Ministry of Education and Research, 2014).

There is great demand, in Norway, for newly qualified teachers, owing to government policy, teacher retirement and attrition projections (Ertesvåg & Røsvik, 2020). Hence, the Norwegian Ministry of Education (2017) has called for an increase in the number of students in teacher education programmes. The situation is quite different in Finland. The Finnish authorities do not expect universities to enrol more student teachers than are expected to be needed by the future labour market (Malinen et al., 2012). Norway has a high turnover rate in teacher education programmes (Panel for Teacher Education Reform, 2015), whereas in Finland, the turnover rate is low (Malinen et al., 2012). Turnover wastes national resources and students' time. High turnover in a teacher training programme could indicate weak coherence and thus, is worthy of investigation. Therefore, for Norway, it is useful to explore antecedents of turnover intention and prospective commitment to the teaching profession. By comparison, Finnish teacher education is considered to be exemplary. We sought to discover the empirical associations between student teachers' campus experiences and field experiences, and their prospective commitment and intentions, using advanced quantitative methods, since "[o]verall there is a lack of rigorous research on the relative effectiveness and outcomes of different models of initial teacher education" (British Educational Research Association [BERA], 2014, p. 19). This study's comparative perspective reviews the embedded beliefs, perspectives and characteristics of teacher education systems in Finland and Norway, given that "looking beyond that country's

experience [is] crucial for recognising the taken for granted assumptions which drive it" (Blömeke & Paine, 2008, p. 2028).

In the Finnish class teacher education programme (grades 1–6), students take a short course in didactics for every school subject. For Finnish subject teachers (grades 7–13), students typically acquire qualifications in two subjects, such as mathematics and physics, and complete a teacher education programme which includes didactics courses on the two subjects and several courses on educational theory, such as general didactics, educational and developmental psychology and diversity in education (multicultural education, special needs education and people skills), which are the same for all student teachers. Education is the main subject studied by student class teachers, and thus, they typically took more educational theory courses, including courses focusing on the philosophy, history and sociology of education, curriculum theory and pedagogical argumentation.

Educational theory courses in Finland and Norway are important and relevant for teachers' expertise. They are important, for example, to understand the cultural structures that hinder pupils' participation in education or to identify hidden discriminatory practices in schools. Furthermore, it is important for teachers to understand the basics of learning difficulties and the legislation and conventions for special needs education (Lee et al., 2015). This understanding is crucial for multi-professional collaboration in schools (Guvå & Hylander, 2012). However, these topics are general and perhaps perceived as abstract and distant by student teachers.

In this paper, first, we explain the theoretical framework. Second, we explore how perceptions of the relevance of campus teaching and aspects of supervision in field experience are related to commitment and intention to quit among Finnish and Norwegian student teachers. Using structural equation modelling, we estimate the strength of the factors that

can foster commitment and the intention to quit. Third, we discuss this comparison of structural equation models, deduce implications for practice and make suggestions for further research.

Theoretical framework

The prospective commitment of student teachers to work as teachers is related to their emotional attachment to the teaching occupation and their identification with it (Allen & Meyer, 1990). These attachments occur when an individual has positive feelings about the thought of becoming a teacher or looks forward to beginning in the teaching profession (van Veen et al., 2005). A committed student teacher typically identifies with the teaching profession and enjoys imagining his or her future in this profession (Caires et al., 2012; Hong, 2010; Human-Vogel & Dippenaar, 2010; Klassen & Ming, 2011; Lamote & Engels, 2010).

Recent empirical research on job turnover (Hom et al., 2012) suggests that turnover intention is a stronger predictor of actual turnover than other variables. Student teachers' field and campus experiences may induce feelings of stress, weariness and vulnerability (Caires et al., 2012). One possible consequence of these feelings is that a student teacher may develop the intention to leave the profession. Intention to quit has been identified as an important outcome variable, which mediates the relationship between attitudes to the occupation, i.e. expected occupational satisfaction, and occupational change behaviour (Rhodes & Doering, 1983; Kelly et al., 2019). Therefore, prospective commitment and intention to quit are relevant dependent variables in a comparative study.

Student teachers in university are supposed to engage in theoretical learning about academic subjects, subject didactics and education theory (named "pedagogy and learner knowledge" in Norway) and then continue to work as teachers and apply what they have learnt (Korthagen & Kessels, 1999) as a means to transfer knowledge (Eraut, 2004). Tryggvason

(2009) found that Finnish teacher educators transmit theoretical and pedagogical aspects of education by incorporating them into their teaching. Rautopuro et al. (2011) explored how Finnish teachers perceived the usefulness of several components of teacher education and found that the academic degree, professional competence and the major subject were the most important factors influencing these perceptions. Similar studies do not exist in Norway.

Grimen (2008) introduced the concept of practical synthesis, which Heggen and Terum (2013) claim "is the result of students experiencing the practical relevance of the curriculum" (p. 658). The relevance of theory is potentially experienced both on campus and in school professional practice. Some studies demonstrate a low perceived relevance of both campus and field experiences (NOKUT, 2018). Therefore, we explored the relationship between perceptions of the relevance of campus courses and student teachers' commitment to work as teachers or leave the teaching profession to pursue other careers.

The prospective commitment to work as a teacher may be strengthened or weakened by experiences in a programme's campus-based elements. If these experiences are perceived to be relevant, they form a knowledge-based foundation for teaching practice in schools. This in turn fosters the students' prospective commitment to work as teachers, whereas a lack of relevance presumably fosters the intention to abandon the profession. Therefore, we formulated the following hypotheses, organised according to the independent variables with two dependent variables and two countries:

- H1 Student teachers' perceptions of the relevance of subject didactics courses to teaching practice are positively related to their prospective commitment to work as teachers.

- H2 Student teachers' perceptions of the relevance of subject didactics courses to teaching practice are negatively related to their intention to abandon the profession.
- H3 Student teachers' perceptions of the relevance of education theory courses to teaching practice are positively related to their prospective commitment to work as teachers.
- H4 Student teachers' perceptions of the relevance of education theory courses to teaching practice are negatively related to their intention to abandon the profession.

Teacher education programmes include school experiences that integrate theory and practice. There are clear challenges in teacher education regarding the coherence and integration of theory and practice (Grossman et al., 2009). We agree that there should be coherence between the theoretical and practical elements in teacher education (Hammerness, 2013). Teaching in Finnish schools is claimed to represent the integration of theory and practice (Malinen et al., 2012), and this so-called research-based practice is deemed to be "a key element in a highly functioning and coherent system" in Finnish teacher education (Tatto, 2015, p. 178). Tryggvason (2009) found that Finnish teacher educators apply a wide variety of pedagogical approaches, such as drama, role play, discussions and argumentation and pluralistic, critical and reflective thinking to overcome the challenges of connecting theory and practice. Thus, Finnish teacher education "is characterised by many key features of research-informed clinical practice" (BERA, 2014, p. 24). Krokfors argues (2007) that practice in research-based teacher education can incorporate not only teaching practice but also research. She points the need for investigation, enquiry and research during student teachers' practice, which integrates theoretical knowledge with data collection and analysis.

In Norway, research-based practice is rarely used, although teacher education is expected to prepare trainees to work in research-based ways, according to the Ministry of Education and Research (2010). Some scholars refer to reflective or theory-practice interaction in supervision or enquiry-based approaches (Eick & Reed, 2002; Gitlin et al., 1999; Tabachnick & Zeichner, 1991; Tom, 1985; Valli, 1992; Zeichner & Teitelbaum, 1982). The present study draws on the concept of theory-practice interaction (Heggen & Terum, 2013) in supervision sessions. We believe that theory-practice interaction in supervision is negatively related to the intention of student teachers intentions to abandon teaching, because this kind of interaction increases motivation.

However, theory-practice interaction in supervision is not the only important aspect of supervision in teacher training. Starting to teach in school can be challenging (Chong & Low, 2009; Hong, 2010), and supervisors' feedback and support are critical in ensuring that students develop proficiency in teaching (Caires et al., 2012). Therefore, we believe that more personalised formative and supportive feedback may enhance the prospective commitment of student teachers to work as teachers and weaken their intention to abandon the profession (Zeichner & Teitelbaum, 1982). We therefore deduced these hypotheses:

H5 Student teachers' perceptions of the theory-practice interaction in supervision are positively related to their commitment to working as teachers.

- H6 Student teachers' perceptions of the theory-practice interaction in supervision are negatively related to the intention to abandon teaching.
- H7 Student teachers' perceptions of personalised feedback are positively related to the prospective commitment to work as teachers.

- H8 Student teachers' perceptions of personalised feedback are negatively related to the intention to abandon teaching.

Both theory-practice interaction in supervision and personalised feedback necessitate the presence of one or more supervisors in schools. For simplicity, we assumed that both these functions could be performed by one supervisor.

To summarise, we have two dependent variables: the commitment to work as a teacher and the intention to quit the profession. We also have four independent variables, two relating to the perceived integration of education concerning theory and practice on campus as well as subject didactics and practice, and two relating to supervisors' work (their feedback, deliberation and communication with students and integration of theory and practice). Our analytical models are visually presented in Figures 1 and 2.

Survey methodology

Samples and procedures

Our analysis is part of a broader research project. A questionnaire was distributed to Norwegian student teachers (n = 491) from several university colleges and universities and one Finnish teacher education institution (n = 153). The samples were not randomly drawn from pools of Finnish and Norwegian student teachers, but cohorts of respondents were carefully selected to ensure diversity. Although we do not know for sure if the cohorts are statistically representative, we believe that the samples are so broadly composed that they give us adequate information about how student teachers assess different aspects of quality. In this article, we have used only some of the total number of indicators in our investigation.

There are clear structural similarities in the composition of teacher education programmes in Finland and Norway (Hansén et al., 2014). For example, in both countries,

campus theory courses (subject didactics and education theory) are taught separately, and several practice periods are supervised in schools by school teachers. All teachers in Finnish comprehensive schools and upper secondary schools must have a master's degree (Niemi & Jakku-Sihvonen, 2006, p. 32). Two Finnish cohorts were available for the study: biology, chemistry, physics and mathematics student subject teachers (grades 7–13) and student class teachers (grades 1–6). Primary school teachers teach grades 1 to 6, and in theory, are able to teach all subjects. But in practice, some teachers are more specialised in particular subjects, like art or science. Student teachers who specialised in other subjects were not available. All Finnish student teachers who were present during the seminar session (educational theory) participated in the study. At the time of data collection, the Finnish biology, chemistry, physics and mathematics student teachers s had completed approximately two-thirds of their pedagogical education.

Measurement instruments

A questionnaire was constructed based on measurement instruments in the literature and new techniques (Haladyna & Rodriguez, 2013). It was developed in Norwegian and translated into Finnish. Previously reported instruments for measuring turnover intention (Kuvaas, 2007) and commitment to work as a teacher (Allen & Meyer, 1990) were adapted. In the questionnaire, the student teachers responded to items on a 7-point Likert scale[1]; 4 represented a neutral midpoint. The concepts were measured with two to four single items. The analysis was based on eight measurement instruments. The internal consistency (Cronbach's alpha, common test score reliability coefficient) for each of the concepts was satisfactory, with a Cronbach's alpha range

[1] The respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of statements.

between 0.67 and 0.94. The indicators and indicator names for each concept are presented in Table 1, and the maximum value, minimum value, mean, standard deviation, skewness, kurtosis and Cronbach's alpha (α) are presented in Table 2.

Research ethics

All participants were above the age of 20 and informed that participation was voluntary and that they might withdraw from the study at any time. Participation was confidential, and it is impossible to trace the original information obtained. Data is kept on a high security server which only two researchers have access to. Questions asked in the study were not particularly sensitive.

Table 1. Overview of constructs, abbreviations and items, four independent and two dependent variables. The "w" numbers refer to item numbers in the questionnaire.

Independent variables
Perceived relevance in education theory teaching (abbreviated as PP)
In education theory teaching: I am given practical examples from actual teaching (w35) The connection between pedagogical theory and practice is made clear (w38)
Perceived relevance in subject didactics teaching (abbreviated as SP)
In subject didactics teaching: I am given practical examples from actual teaching (w39) I have become familiar with academic content that is relevant to the work of a teacher (w40) The connection between subject didactic theory and practice is made clear (w42)
Theory–practice interaction in supervision (abbreviated as IS)
In the practice periods: I get to know how the study subject is relevant in school (w44) I discuss with my mentors how the subject matter can be applied in developing my teaching practice (w45) I discuss practical experiences with my mentors in light of what we have learnt so far (w46)
Personalised feedback (abbreviated as SS)
Mentoring meetings at the practice school help me understand what I should do to improve as a teacher (w51) Mentors at the practice school give me clear and direct feedback about my performance (w53) Feedback from mentors at the practice schools closely relates to what I have actually achieved (w54) Feedback from mentors at the practice schools makes clear what is expected of me as a student teacher (w55)
Dependent variables
Prospective commitment to work as a teacher (abbreviated as ID)

I feel attracted to the teaching profession (w3)
It feels good to think that one day I will be a teacher (w4)
I am looking forward to working as a teacher (w5)

Turnover intention (abbreviated as TI)

If I find a well-paid job after my teacher education, I will not work as a teacher (w56)
I often think about career possibilities other than the teaching profession (w57)
If I could go back and choose afresh, I would choose something other than teacher education (w58)
Other careers are more attractive to me than the teaching profession (w59)

Analysis

To analyse the relationships between the variables, structural equation modelling was used (Kline, 2005), as it is suitable for confirmatory factor analysis and path analysis. Amos was used as statistical software. Maximum likelihood was used for estimating the parameters in the model. We tested whether the model fit the data gathered on Norwegian and Finnish participants equally well by assuming that the regression coefficients were the same but that the factor loadings could be different.

The assessments of fit between the model and data were based on the following indices: root mean square error of approximation (RMSEA), normed fit index (NFI), goodness-of-fit index (GFI) and comparative fit index (CFI). An RMSEA < 0.05 and NFIs, GFIs and CFIs > 0.95 indicate a good fit, whereas an RMSEA < 0.08 and NFIs, GFIs and CFIs > 0.90 indicate an acceptable fit (Kline, 2005). The actual values reported in Figures 1 and 2 show an acceptable fit.

Results

We present two analytical multivariate models with two dependent and interrelated variables. Figures 1 and 2 show the estimated structural models; prospective commitment to work as a teacher and intention to leave the profession are the dependent variables for Finland and Norway. Ellipses represent the latent variables, circles represent measurement errors and rectangles represent the observed measured variables. The structural models consist of terms with paths (arrows) between them. The path arrows indicate common theoretical causes, and the figures (standardised regression coefficients) reflect the measured strength of the connections, which

increases with numerical value. Table 2 shows the descriptive statistics, and Table 3 shows the inferences related to the hypotheses.

Table 2. Descriptive statistics of single item variables

Item	Norway (n = 491)							Finland (n = 153)						
	Min	Max	Mean	SD	Skew	Kurt	Alpha	Min	Max	Mean	SD.	Skew	Kurt	Alpha
w3	1	7	5.63	1.20	-0.79	0.42	.88	2	7	5.78	1.01	-0.71	0.72	.88
w4	1	7	5.73	1.29	-0.99	0.63		2	7	6.03	1.02	-1.30	2.39	
w5	1	7	5.91	1.21	-1.11	1.01		1	7	5.9	1.08	-1.21	2.25	
w56	1	7	3.05	1.78	0.55	-0.62	.89	1	7	3.24	1.77	0.43	-0.93	.87
w57	1	7	3.42	1.89	0.40	-0.97		1	7	3.43	1.93	0.41	-1.16	
w58	1	7	2.23	1.52	1.35	1.32		1	7	1.99	1.26	1.46	1.91	
w59	1	7	2.59	1.66	1.06	0.40		1	7	2.74	1.62	0.84	-0.06	
w35	1	7	3.86	1.57	0.06	-0.77	.91	1	7	3.16	1.51	0.48	-0.41	.68
w38	1	7	3.64	1.56	0.24	-0.56		1	6	3.18	1.30	0.17	-0.77	
w39	1	7	4.47	1.61	-0.33	-0.71	.94	2	7	4.95	1.31	-0.79	-0.03	.79
w40	1	7	4.84	1.47	-0.62	-0.14		2	7	4.69	1.22	-0.25	-0.42	
w42	1	7	4.30	1.58	-0.22	-0.60		1	7	4.50	1.33	-0.60	-0.06	
w44	1	7	4.78	1.50	-0.45	-0.36	.80	1	7	4.66	1.39	-0.44	-0.15	.67
w45	1	7	3.98	1.69	-0.01	-0.84		1	7	3.24	1.58	0.39	-0.63	
w46	1	7	4.72	1.67	-0.45	-0.63		2	7	5.12	1.35	-0.44	-0.56	
w51	1	7	5.39	1.55	-0.94	0.08	.90	1	7	5.65	1.23	-1.17	1.71	.88
w53	1	7	5.21	1.61	-0.76	-0.22		3	7	5.6	1.11	-0.66	-0.14	
w54	1	7	5.52	1.37	-1.02	0.93		2	7	5.37	1.09	-0.51	-0.29	
w55	1	7	4.99	1.63	-0.66	-0.40		1	7	5.34	1.19	-0.66	0.60	

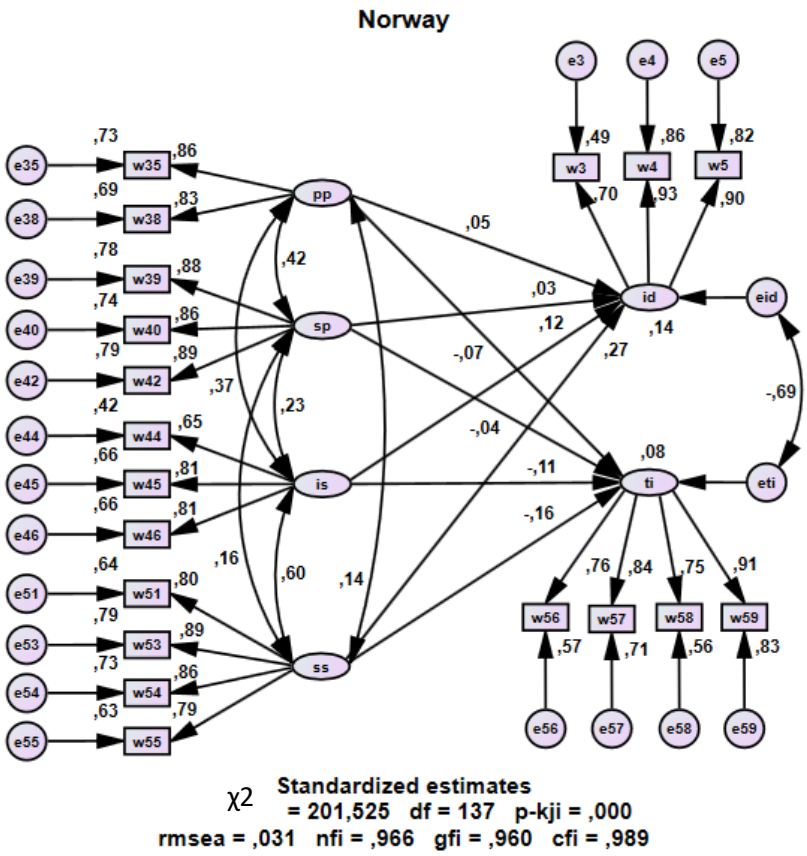

Figure 1 Predictions of prospective commitment to work as a teacher and turnover intention among Norwegian student teachers (n = 491).

Prospective commitment to work as a teacher = ID; turnover intention = TI; perceived relevance in education theory teaching = PP; perceived relevance in subject didactics teaching = SP; theory–practice interaction in supervision = IS; personalised feedback = SS. ‘e’ indicates measurement errors. Numbers are standardised regression estimates. ‘w’ indicates the number of the item.

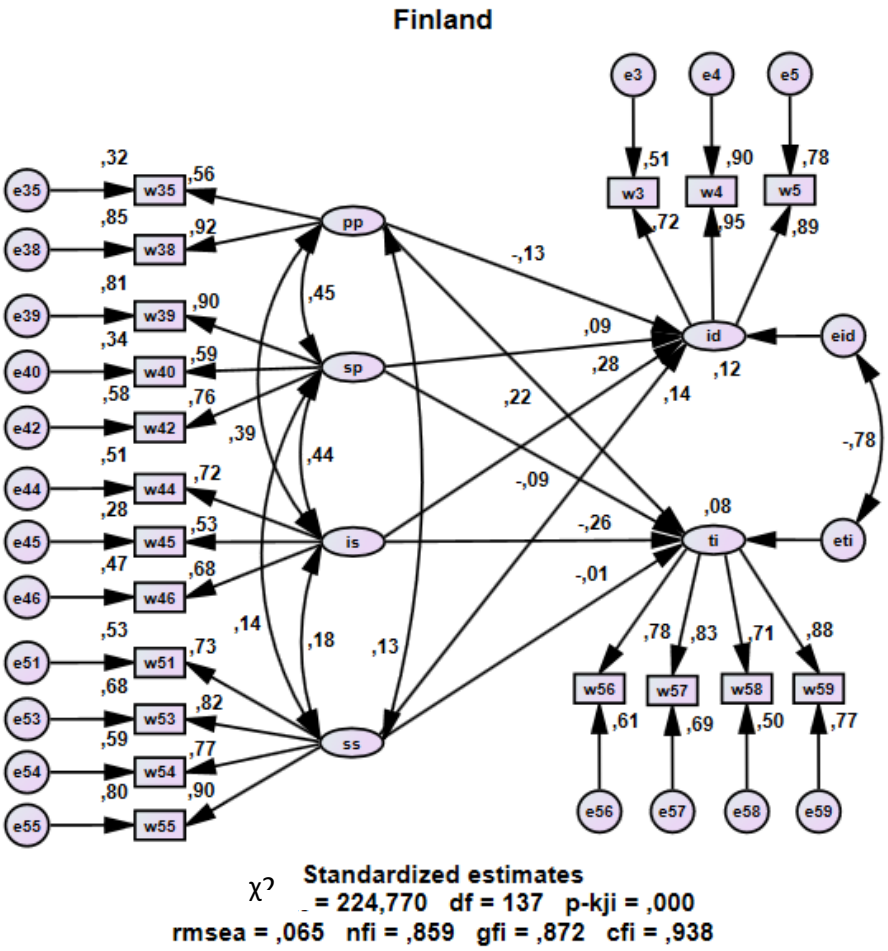

Figure 2 Predictions of prospective commitment to work as a teacher and turnover intention among Finnish student teachers (n = 153).

Prospective commitment to work as a teacher = ID; turnover intention = TI; perceived relevance in education theory teaching = PP; perceived relevance in subject didactics teaching = SP; theory–practice interaction in supervision = IS; personalised feedback = SS. ‘e’ indicates measurement errors. Numbers are standardised regression estimates. ‘w’ indicates item number.

Related to our hypotheses, these findings indicate the following:

Table 3. Inferences related to the hypotheses

Number	Wording	Finland	Norway
H1	Student teachers' perception of subject didactics courses' relevance to teaching practice is positively related to their prospective commitment to work as a teacher. sp -> id	p = .427	p = .521
H2	Student teachers' perception of subject didactics courses' relevance to teaching practice is negatively related to their intention to abandon the profession. sp -> ti	p = .416	p = .452
H3	Student teachers' perception of education theory courses' relevance to teaching practice is positively related to their prospective commitment to work as a teacher.pp -> id	p = .219	p = .391
H4	Student teachers' perception of education theory courses' relevance to teaching practice is negatively related to their intention to abandon the profession. pp -> ti	P =.053	p = .241
H5	Student teachers' perception of theory–practice interaction in supervision is positively related to their prospective commitment to work as a teacher.is -> id	p < .05	p = .107
H6	Student teachers' perception of theory–practice interaction in supervision is negatively related to their intention to abandon teaching. Is -> ti	p < 05	p = .148
H7	Student teachers' perception of personalised feedback is positively related to their prospective commitment to work as a teacher. ss -> id	p = .120	p < .05
H8	Student teachers' perception of personalised feedback is negatively related to their intention to abandon teaching. ss -> ti	p = .940	p < .05

Is a common model approach better than an approach with separate models? Table 3 shows the results of testing whether separate models for Norway and Finland fit better than a common model. If we use the separate model approach, the path coefficients are estimated freely in Norway and Finland. If we use a common model approach with an assumption that the path coefficients are equal, we find that $\chi 2 = 433{,}458$ with 282 degrees of freedom.

We find that $\chi 2 = 6{,}603$ is not significant with 8 degrees of freedom. In other words, the common model approach fits just as well as the separate model approach, which analyses data sets from Norway and Finland using separate models. An interpretation of this inference is that the statistical associations in the data sets from Norway and Finland follow the same main patterns. These results emerge through an analysis of quality aspects of teacher education in the two countries as the student teachers perceive quality differently. We cannot rule out the fact that experts would be able to judge quality differently, but we find—albeit with some nuances

(hypotheses 5–8, table 3)—similar patterns in statistical associations between the two countries' teacher education programs.

Discussion and conclusions

High-quality teaching is the most important factor in raising student achievement (Chetty et al., 2014; McCaffrey et al., 2009; Rivkin et al., 2005; Rockoff, 2004). Successful teacher education depends on the motivation and dedication of teacher educators to do their best for student teachers' learning and intellectual growth. (Day, 2013; Shagrir, 2015). The relevance to teaching and the creation of a practical synthesis that creates coherence (Grimen, 2008) are key aspects of campus-based education and field components of teacher training.

Our theoretical premise is that the coherence of campus-based and teaching-practice-based elements of teacher education is likely to foster student teachers' commitment to teaching and discourage them from abandoning the profession. Thus, this study aimed to explore how coherence in Finnish and Norwegian teacher education is related to student teachers' prospective commitment to work as teachers or to pursue different careers. We compared a common model approach with an approach with separate models for Norway and Finland and found that the common model approach fits just as well as the separate model approach. Therefore, we infer that the statistical associations in the data sets from Norway and Finland follow the same main patterns. Certain nuances aside, the main patterns that emerged in the analysis of the material, were that experiences from campus-based teaching (educational theory PP and subject didactics SP) among the Norwegian and partly among the Finnish student teachers, showed quite weak statistical associations with prospective commitment to teaching and intention to quit when other variables were controlled. There were much stronger associations between prospective commitment to work as a teacher and experiences gained

during teaching practice in schools than for the theoretical campus-based elements. These results highlight the importance of school practice in teacher training.

Theory-practice interaction in supervision was more strongly associated with prospective commitment in Finland than in Norway. Furthermore, the standard deviations of the items were much larger in the Norwegian sample (Table 2). This indicates larger quality deficits in some Norwegian practice schools compared with Finnish practice schools. The Finnish model of research-based practice could thus be worth emulating. However, the means of the two items deduced from the concept of theory-practice interaction were larger in the Norwegian sample than in the Finnish sample (Table 2). We believe these patterns could be an area for further research.

The weak relationship between campus-based education and school-based practice in teacher education programmes is a challenge that has historically plagued Norwegian teacher training (Elstad, 2010). A particular challenge is that school-based practice mentors may not use the same professional language as that employed in institutional teacher education on campus (Joram, 2007). Afdal and Nerland (2014) explored the differences in knowledge between Norwegian and Finnish novice teachers and found that the Finnish teachers used more specialised language to frame their concepts. This suggests another area for further research. Furthermore, Finnish schools are reportedly specially designated and appropriately staffed as training schools, operating in partnership with universities (BERA, 2014, p. 23). Finnish school supervisors are required to complete a short supervision course. In Norway, specific courses are recommended for school supervisors, but not required, although supervision courses are quite popular. However, in Norwegian practice schools, teachers may not be highly committed to supervision.

Personalised formative feedback was more strongly related to commitment in Norwegian practice schools than in Finnish practice schools (however, the means of the items were mainly larger in the Finnish sample). A possible interpretation is that Norwegian supervisors emphasise personal support for mastering the challenges of teaching, which fosters commitment. Further research could investigate the communication culture among student teachers and supervisors.

One unexpected result was that the perceived relevance of education theory teaching on campus was negatively associated with Finnish student teachers' prospective commitment to work as teachers, while the perceived relevance of subject teaching on campus was positively associated with their commitment. Similarly, the perceived relevance of education theory teaching on campus was clearly positively associated with the intention of Finnish student teachers to abandon the profession. Furthermore, the means of the indicators (Table 2) were low, especially in Finland. A practical implication of this finding is that Finnish education theory teachers could consider systematically reviewing the relevance of the courses they teach. We agree with Jenset et al. (2019) that, to generate professional learning, field placement needs to be scaffolded within a pedagogy of teacher education.

Limitations

The Finnish sample comprised pre-service students with science and mathematics backgrounds and class teachers. Experience with authentic science or mathematics research in university could mean that these students were enculturated in a scientific epistemology that equipped them with certain attitudes (Roth, 2001). When these students encountered education theory in a teacher education programme, they may have found it trivial and characterised it as having professional standards that are weak or at least not on par with professional standards in science

(Roth, 2001) or mathematics (Bishop, 1991). If this is the case, Finnish educators could explore better ways to accommodate maths and science specialists. Another explanation might be that those who find educational theory teaching relevant are more interested in education as a discipline and perhaps more eager to continue studies in education than work as teachers. However, these speculations need more foundational research.

Our study has other limitations from a conceptual perspective (parsimonious modelling) and in its methodological (cross-sectional) approach. We chose a quantitative approach to estimate the strength of the contributions of both campus- and practice-based elements of teacher education to student teachers' commitment and intention to pursue teaching. An in-depth, qualitative follow-up study could yield insights into the underlying processes of student teacher and mentor interactions. A future research idea could also be to conduct an analysis at the individual level, for instance, an exploration of student teachers who are theory oriented, practice oriented, etc. The different language used by teacher educators and practice supervisors is a key point that deserves further analysis and can be measured more effectively through observation (Joram, 2007). In-depth case studies with observations, interviews with student teachers, analyses of their teaching plans and the educators and supervisors' written and oral feedback to learners could be relevant. A qualitative approach could also explore the link between perceived feedback from supervisors and supervisors' skills in relating the theoretical framework of the teacher education course to experiences during teaching practice and student teachers' cognitions and actions.

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