Nordic Journal of Comparative and International Education (NJCIE)

NJCIE 2021, Vol. 5(1), 85–103 http://doi.org/10.7577/njcie.4122

Scientifically Designed Teacher Education – Teacher Educators' Perceptions in Finland and Norway

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Peer-reviewed article; received 22 December 2020; accepted 05 July 2021

Abstract

This paper investigates teacher educators' perceptions of scientifically designed teacher education in Finland and Norway and asks the following research questions: How do teacher educators in Finland and Norway perceive scientifically designed teacher education? How do they perceive teacher education regarding the research-led, research-tutored, research-based, and research-oriented dimensions? The study is comparative and uses a quantitative methodological approach based on a questionnaire survey administered to teacher educators in three departments of teacher education, two in Norway and one in Finland. The findings indicate overall positive and quite similar perceptions between the two countries. Despite the similarities, there were differences, particularly in the dimension concerning teacher-focused activities and in the research-tutored dimension. Furthermore, teacher educators' perceptions were more varied among the Norwegian teacher educators, compared to the Finnish respondents.

Keywords: scientifically designed teacher education; teacher educators; research; comparative; quantitative

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 ISSN: 2535-4051

Introduction

Teacher educators have an essential role in delivering high-quality teacher education and educate professional teachers to maintain a high standard of teaching and learning in schools (Goodwin et al., 2014; Izadinia, 2014; Vanassche et al., 2015). Numerous studies have highlighted the importance of teacher educators as agents rather than objects of teacher education reforms (Cochran-Smith et al., 2018), particularly their research-related activities (Goodwin et al., 2014; Harrison & McKeon, 2010). Although research on teacher education has been increasing globally over the past two decades, little research has focused on teacher educators (Ellis et al., 2014; Maaranen et al., 2019) and research on how the concept of scientifically designed teacher education is understood and implemented by teacher educators, is lacking (Flores, 2018; Ping et al., 2018).

Willemse and Boei (2013) showed that diversity in teacher educators' capabilities and backgrounds leads to different opinions about the importance of research. They argued that a crucial condition for establishing a culture of research is the development of a shared language and vision of research in the sphere of teacher education. Munthe and Rogne (2015) emphasised that teacher educators' competence levels are essential to fostering a research culture. Smith and Flores (2019) referred to communities of practice and claimed that teaching and research are equally important in supporting prospective teachers' competence. Research thus becomes a significant prerequisite in recruiting research qualified teacher educators. Nasser-Abu and Majdob (2017, p. 46) stressed that teacher educators' academic degrees predict their research productivity. The research culture and everyday practice, constituting the context, strongly influence teacher educators and their understanding of their work and role as professionals, as well as their professional development (Vanassche et al., 2015).

The role of research in teacher education is interesting from both Finnish and Norwegian perspectives. Finland has employed scientifically designed teacher education for four decades and has a homogeneous group of teacher educators. By contrast, Norway has recently introduced this design, and the population of teacher educators is more diverse. Thus, the Finnish and Norwegian teacher education systems are both scientifically designed yet different in their reform pace and focus on their scientific approach.

Still, little is written about teacher educators' perceptions of scientifically designed teacher education. Having more knowledge about how teacher educators experience this design in the two countries could broaden our understanding of how it contributes to the qualification of prospective teachers and, consequently, provide a basis for the continued development of teacher education. As such, this case study investigates teacher educators' perceptions of scientifically designed teacher education in Finland and Norway.

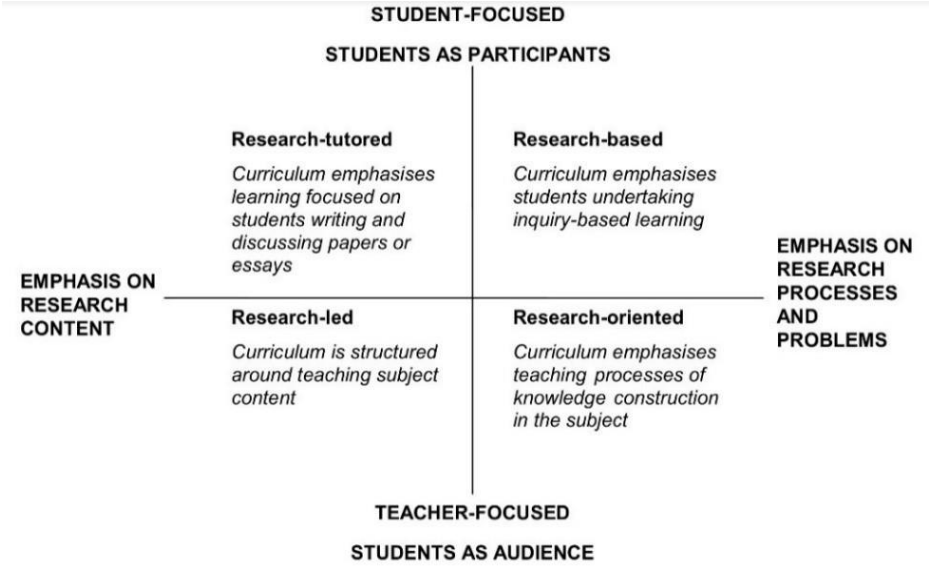
In Finland and Norway, the concept of research-based teacher education is frequently used to refer to a scientifically designed approach (Munthe & Rogne, 2015; Niemi & Jakku-Sihvonen, 2006). However, in this study, Healey's model, which includes the concept research-based (see Figure 1) is used both as a theoretical and analytical framework.

We, therefore, consciously choose the term *scientifically designed teacher education* as an overarching concept that covers all kinds of research approaches within the framework of teacher education.

Theoretical framework

Understanding a scientifically designed teacher education approach is demanding and allows for multiple interpretations. In both Finland and Norway, the concept of research-based teacher education is, as previously stated, often used to refer to a scientifically designed approach (Munthe & Rogne, 2015; Niemi & Jakku-Sihvonen, 2006). However, a quick overview of the research field reveals a variety of overlapping concepts for denoting these kinds of approaches (Burn & Mutton, 2015; Cochran-Smith & Fries, 2008; Kansanen, 2014). For instance, the notion of inquiry involves, according to Munthe and Rogne (2015), an investigative stance that does not necessarily aim to publish results outside of the local context. Inquiry can also be defined as an evidence-based or evidence-informed practice. Research, on the other hand, relies on suitable and relevant research methods, a firm literature review and previous studies in the field. While inquiry is local, research aims to publish and reach a global audience (BERA, 2014). Regarding the relationship between research and practice, it is still somewhat unclear what it means in different contexts (Alvunger & Wahlström, 2018; Baan et al., 2019; 2020; Puustinen et al., 2018). The research field also provides a set of typologies aimed at distinguishing different variations of the scientifically designed approaches. For example, Griffith (2004) provides a typology describing four forms of approaches in teacher education: research-led, research-based, research-informed and research-oriented. This typology has been slightly modified by Healey (2005), as shown in Figure 1.

Figure 1: Curriculum design and the research–teaching nexus



Source: Healey (2005, p. 13)

Our use of Healey's (2005) model sets the sight on teacher educators' perspectives on teacher-versus-student-focused activities. Regarding the research-led dimension, teacher educators carry out research and base their teaching on their personal research findings. The teacher education programme, or, in Healey's terms, curriculum content, is dominated by the teacher educators' research interests, and information transmission is the way of teaching. The focus is on students' understanding of the research findings based on the teacher educators' research activity. As for the research-oriented dimension, teacher educators' research experiences are not necessarily stressed in an obvious way. The teaching is teacher-focused and aimed at developing student teachers' inquiry skills and engendering a research ethos. Student teachers not only learn about scientific knowledge but also understand the processes by which knowledge is produced. Thus, the curriculum emphasises both knowledge and the research process. According to the research-based dimension, teacher educators enhance the development of student teachers' research activities rather than their acquisition of subject content. The teacher educators' research experiences are appreciated and integrated into the student teachers' learning activities. The curriculum is, therefore, primarily designed around inquiry-based activities, and the division of roles between teacher and student is minimised. Concerning the research-tutored (or research-informed, according to Griffiths, 2004) dimension, teacher educators' roles are less prominent. Student teachers engage in discussions on research with other parties, such as tutors and peers. The emphasis is on research content, and the teaching is student-focused (Healey, 2005).

The four dimensions in Healey's (2005) model are arranged along the horizontal and vertical axes (see Figure 1). The horizontal axis moves from an emphasis on research content to research processes and problems, while the directional movement of the vertical axis traverses from teacher- to student-focused activities (Griffiths, 2004). All four dimensions focus on scientifically designed approaches, as shown, but they have different emphases and are only analytically separated. In reality, teacher education programmes represent various combinations that depend on ideological and legislative conditions.

These four dimensions characterise the complexity of defining scientifically designed teacher educations. When positioning research in Finnish teacher education into Healey's model, it evidently belongs in the upper-right quadrant, designated as research-based. However, when we compare the definition of the research-based approach in Healey's (2005) model with the Finnish interpretation of it, conspicuous differences appear (Kansanen, 2014; Niemi & Jakku-Sihvonen, 2006). A research-based approach in the Finnish teacher education system represents, compared to an inquiry orientation, a conventional research tradition that includes, for example, a repertoire of methods and internationally published research. Although the concept of a research-based approach is used in Norway prior to the 2017 reform, there was an emphasis on the two bottom quadrants, which are both in the teacher-focused section of the model, with the students as an audience (Munthe & Rogne, 2015). Despite different foci in the two teacher educations, it is evident that the four dimensions in Healey's model emerge in various degrees in both countries, as in all

scientifically designed teacher education. Referring to the scrutiny above, this study uses Healey's model (later elaborated by Jenkins & Healey, 2015) as the frame for investigating teacher educators' perceptions of scientifically designed teacher education in Finland and Norway. In strengthening scientificity in teacher education from the student teachers' perspective, Klieme et al. (2020) adapted the model for connecting research and practice. Despite being established nearly two decades ago, the model remains applicable for scrutinising scientifically designed teacher education from different perspectives. We elaborate on our use of the model in the methodological section.

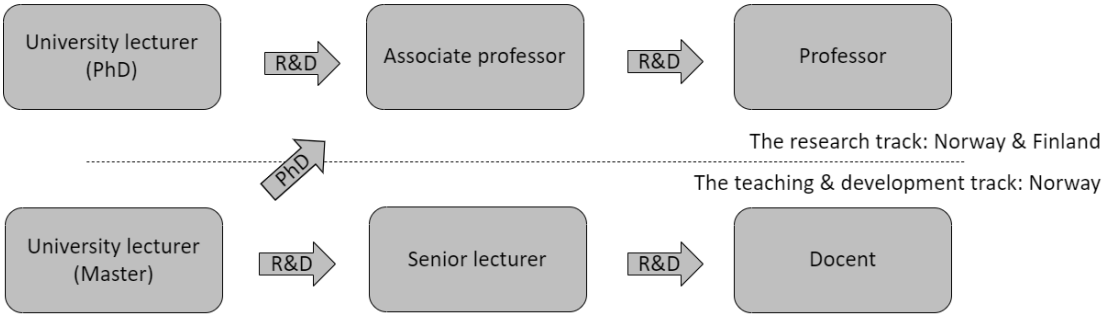
Context of the study

In the following section, we briefly introduce the two teacher education contexts.

In Finland, the education of primary school teachers has been university and research-based, attached to five-year master's degree programmes since the 1970s. Not only are the bachelor's and master's theses requirements explicitly incorporated into the research-based approach, but the entire education is also permeated with a scientifically oriented approach, which, for instance, influences the selection of course literature and how seminars are conducted. The aim is to prepare inquiry-oriented and critically reflective professional teachers, highlighting their ability to successfully apply argumentation, decision making and justification in solving pedagogical problems. The teacher educator is required to have a doctoral degree and is therefore qualified to undertake research. Presently, most teacher educators are also qualified as teachers, although there are no official requirements to have teacher qualifications (Hökkä et al., 2017; Krokfors et al., 2011; Maaranen et al., 2019; Tirri, 2014).

In Norway, teacher education for primary and lower secondary levels is in the process of changing from four-year bachelor's degree to five-year master's degree programmes, emphasising research-based teacher education. Research-based teaching has been explicitly promoted in Norwegian teacher education since its reform in 2010 when a compulsory bachelor's thesis was included as part of the curriculum (Ministry of Education and Research, 2010). In an investigation, the characteristics of research-based teacher education after this reform revealed that the extent and depth of the research focus varied, and there was limited systematic planning at the programme level (Munthe & Rogne, 2015). Furthermore, they found the proportion of teacher educators holding a PhD to be less than 33% but increasing. Challenges related to the implementation of a master's-based teacher education design have been further elucidated, and the collective knowledge base among teacher educators is weak, which causes uncertainty regarding supervision and the function of a master's thesis (Jakhelln & Lund, 2019). The shift towards research-based teacher education has also resulted in a national process in which university colleges have merged into universities (Smith & Flores, 2019). Figure 2 summarises the two tracks of qualifying teacher educators in Finland and Norway.

Figure 2: An overview of the two main tracks of becoming and developing as a teacher educator in Finland and Norway



Methods

As part of a larger comparative research project comprising cases of teacher education departments, two in Norway and one in Finland, the methodological approach in this article is quantitative and based on a questionnaire survey. The institutions were selected based on the pragmatic principles of convenience. Since these kinds of comparative studies have not to our knowledge been carried out, we map the overall patterns as a starting point for further qualitative studies. Comparisons could contribute to the importance of different dimensions of scientifically designed teacher education and to investigating teacher educators' perceptions in two countries (Esser & Vliegenthart, 2017). The units of analysis are based on a common theoretical framework, that is, Healey's (2005) model and four dimensions aimed at distinguishing different variations of scientifically designed approaches. The aim is condensed into the following two research questions:

(1) How do teacher educators in Finland and Norway perceive scientifically designed teacher education?
(2) How do teacher educators in Finland and Norway perceive teacher education regarding the research-led, research-tutored, research-based and research-oriented dimensions?

Respondents and questionnaire

The survey was carried out between December 2018 and March 2019. The questionnaire was sent to all teacher educators in a department of primary school teacher education in Finland and both primary and secondary teacher education departments in Norway. All teacher educators in the respective institutions were invited to participate in the online questionnaire, and one reminder was sent.

The questionnaire, based on Healey's model (2005), consisted of 14 items, measured on both nominal and ordinal levels, in addition to open-ended questions that allowed the respondents to make complimentary comments. A five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree), was found appropriate for the aim and

respondent groups (Likert, 1932). The first series of questions related to different background characteristics, experience in supervising master's theses, perceptions of working in teacher education and research activity. Table 1 presents an overview of the various background variables for the respondents.

Table 1: Background variables

Variables	Comments	Finland	Norway
Population	N = 404	79	325
Sample	N = 148	28	120
Response rate		~35%	~37%
Gender			
Female		20	67
Male		8	50
Academic background and qualifications			
Years in teacher education	Number of years in teacher education given as mean (standard deviation)	12.27 (9.38)	10.51 (7.09)
Participating in research groups	Percentage attending research groups	89%	83%
Type of highest academic degree	PhD OR master's degree Percentage is given for holding a PhD	61%	41%
Nature of highest academic degree	Subject specific OR education (didactics/pedagogy) Percentage is given for education	75%	48%
Experience with supervision of master's theses	Percentage is given for experience with supervision of master's theses	71%	57%
Discipline:			
• *STEM*	Science, mathematics, information and communication technology	11%	23%
• *Practical and esthetical subjects*	Music, drama/theatre, art and crafts, food and health sciences and physical education	29%	20%
• *Languages*	Language 1, Sami, English, other languages	29%	27%
• *Pedagogy*	Pedagogy	32%	23%
• *Social sciences*	Social studies and religion and ethics	0%	8%

Next, the teacher educators were asked four questions regarding their perceptions of scientifically designed teacher education. Questions 6–9, shown in Table 2, were given as statements related to research-led, research-tutored, research-based, and research-oriented teacher education (Healey, 2005). To measure the respondents' attitudes towards the different dimensions, each of them consisted of four statements (Likert items) that were combined into a single composite score in the analysis (Boone & Boone, 2012).

Table 2: Statements given in questions 6 to 9

Dimensions	Statements
Research-led	Q6: As a teacher educator, it is important to • build the teaching on relevant research • present your own research for the student teachers • make use of scientific syllabus • give the student teachers some insight into research by letting them participate in research projects
Research-oriented	Q7: I find it important that a teacher educator teaches the student teachers in • analytical ways of thinking and critical reflections • research methodology • how to search for relevant literature • research ethics
Research-tutored	Q8: I find it important that student teachers • read and discuss academic texts and research articles • present their research and development projects to fellow student teachers • discuss and give feedback on each other's research and development projects • collaboratively conduct research and development projects
Research-based	Q9: I find it is important that student teachers • do their own scientific investigation (e.g. bachelor's and master's theses) • develop competence in academic writing • develop competence in research methods • develop competence in research ethics

To validate the developed questionnaire and carry out a reliability analysis, a pilot study was performed on a set of Likert items for each of the dimensions. The pilot consisted of 38 teacher educators from Finland and Norway, who were not part of the studied population. Discussions with some of the respondents enabled us to refine the questionnaire. The internal consistency of each dimension was measured using Cronbach's α (Cronbach, 1951), which was calculated to be $\alpha S1 = 0.75$ for research-led statements, $\alpha S2 = 0.88$ for research-oriented statements, $\alpha S3 = 0.98$ for research-tutored statements and $\alpha 41 = 0.95$ for research-based statements. In general, a Cronbach's α value of 0.7–0.9 is considered acceptable (George & Mallery, 2003; Nunnally, 1978). Based on this pilot study, statements on research-led teacher education were rewritten for a more unidimensional construct. The internal consistency was also re-calculated for the main study (N = 148), giving α values of $\alpha S1 = 0.72$, $\alpha S2 = 0.82$, $\alpha S3 = 0.87$ and $\alpha S4 = 0.91$. These values indicated that the internal consistency of the four dimensions was appropriate, and the four items collectively mirrored the content of each dimension. The respondents in the pilot study consisted of a more homogenous group compared to the main study, which may contribute to the generally lower Cronbach's α in the pilot study.

Analysis of the data

Descriptive statistics and plots were applied to visualise the data from Finland and Norway in the four dimensions (Q6–Q9; see Table 2). The score values entered by a respondent in the four statements (constituting a dimension) were summarised for each of the four dimensions. A visual inspection of the summated scores showed a non-normal distribu-

tion; hence, non-parametric statistics were used. The summated scores were further averaged to give a mean-item summated score value, hereafter referred to as a mean-score value, for each respondent (Boone & Boone, 2012); the values thereby fell within the range of the original five-point Likert scale. The central tendency was given both as median (Md) and mean (M), and variability was reported as a range (minimum value, maximum value), interquartile range (IQR; 75th percentile–25th percentile), and standard deviation (SD).

Analyses of the differences in mean-score values (for each dimension) between groups that compose a background variable (see Table 1) were conducted. Due to the small sample size, particularly from Finland, performing the analyses between groups separately for each country would give a very low statistical power. These analyses are therefore conducted combining the samples from the two countries and will give a valuable indication of the difference in background variables across and between Norway and Finland (in addition to the *country* variable, see Table 4). For categorical variables, Wilcoxon rank-sum tests (two-sided) were applied to compare any statistically significant differences in the distribution between two samples (i.e., the two groups were likely to be derived from the same population). A Kruskal–Wallis test was used on more than two samples. For continuous variables, a Spearman rank-order correlation was applied to test for any association between mean-score values and variables.

To correct for multiple testing, a significance level of $\alpha = 0.01$ was chosen instead of 0.05. A Bonferroni correction provides, to some extent, a smaller corrected α, but it is also quite conservative; therefore, a pragmatic level of $\alpha = 0.01$ was chosen. The common language effect size (McGraw & Wong, 1992) was calculated for the Wilcoxon rank-sum test as $U/(n1 \cdot n2)$, where U is the Wilcoxon rank-sum test statistics, and n1 and n2 are the respective sample sizes of the two groups compared (Grissom & Kim, 2012). Epsilon-squared was applied as the effect size for the Kruskal–Wallis test (Kelley, 1935). Analyses were conducted using R (R Core Team, 2019).

Methodological considerations

Although a response rate of approximately 35% is considered to be relatively moderate to high, the response rate in our study may carry the risk of lower validity. Appropriate measures were taken to increase the response rate. Different approaches were applied to inform potential respondents in advance of the questionnaire, directly during staff meetings and via email from the deans. These approaches may have contributed to differences in how the respondents perceived the study and their participation. A low response rate could imply an underestimation of the spread of the underlying population. However, we assessed the study's validity to be high, as the respondents are representative of the (restricted and well-known) population concerning several variables, including academic positions/degrees and professions. Moreover, we argue that the similar response rate in the two countries creates little bias in the study. As the analysis was performed separately

for each background variable, it is difficult to interpret how they might collectively influence the perceptions (mean score) given in the four dimensions (i.e., be confounding). A multiple regression analysis was preferable to account for all variables in a single analysis; however, the assumptions for this method were not met.

Ethical considerations

The research project is in accordance with the guidelines provided by the Finnish Advisory Board on Research Integrity (2016) and by the Norwegian National Committee for Research Ethics in the Social Sciences and the Humanities. Following the Norwegian Social Science Data Services (NSD), several measures were taken to keep the respondents of the study anonymous. The respondents were not directly identified because a link between the email, the IP address and the online-based questionnaire was not established. Furthermore, only a few background variables were selected from the questionnaire, making the respondents more anonymous. However, since some of the respondents could be identified by combining background variables, the Norwegian respondents explicitly gave their consent as part of the questionnaire. The same procedure was not required for the Finnish respondents. The data are stored in accordance with the General Data Protection Regulation (EU) 2016/679.

Results

Description of the data

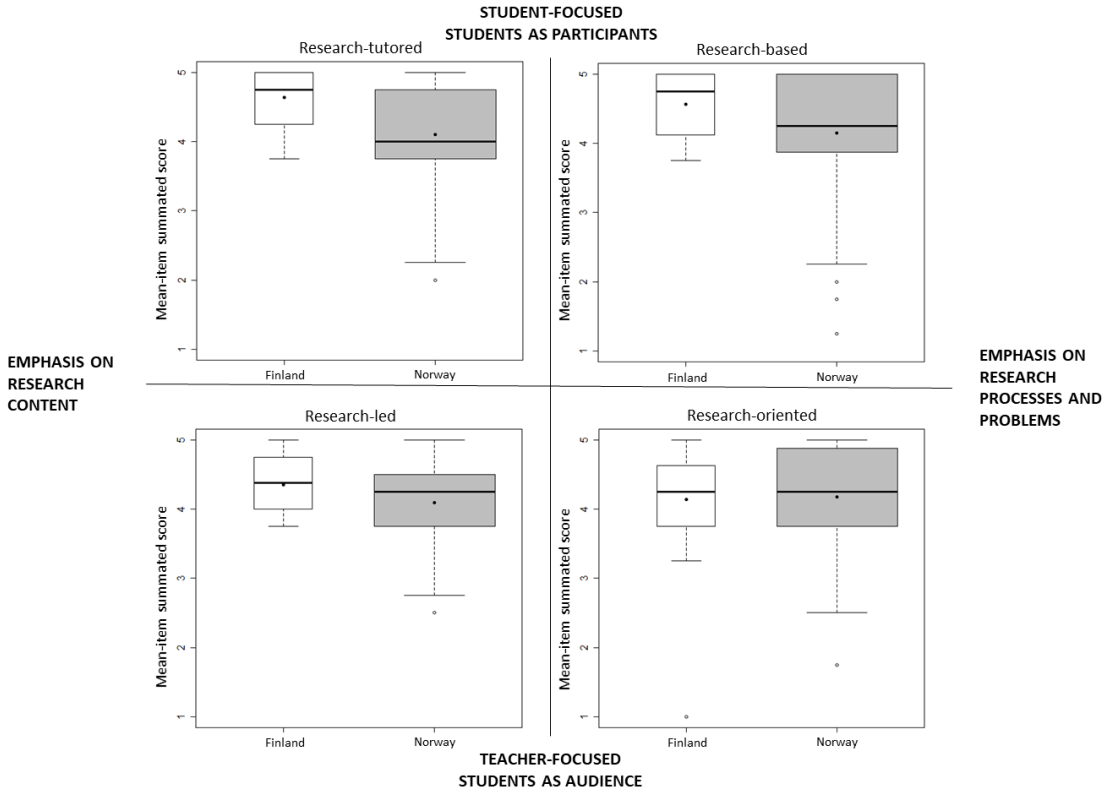
Table 3 presents the prescriptive data, which are visualised by boxplots in Figure 3 to display any differences in the patterns of the mean scores for the four dimensions between Finland and Norway.

Table 3: Descriptive data for Finland and Norway on the four dimensions of scientifically designed teacher education

Dimensions	Finland				Norway			
	Min	**Max**	**Md (IQR)**	**Mean (SD)**	**Min**	**Max**	**Md (IQR)**	**Mean (SD)**
Research-led	3.75	5.00	4.38 (4.00–4.75)	4.35 (0.43)	2.75†	5.00	4.25 (3.75–4.50)	4.10 (0.65)
Research-oriented	3.25*	5.00	4.25 (3.75–4.63)	4.14 (0.81)	2.50†	5.00	4.25 (3.75–4.88)	4.18 (0.69)
Research-tutored	3.75	5.00	4.75 (4.25–5.00)	4.63 (0.41)	2.25††	5.00	4.00 (3.75–4.75)	4.10 (0.73)
Research-based	3.75	5.00	4.75 (4.13–5.00)	4.56 (0.46)	2.25†††	5.00	4.25 (3.88–5.00)	4.15 (0.80)

Min = minimum, Max = maximum, Md = median, IQR = interquartile range, M = mean, SD = standard deviation, †excluding one smaller outlier, ††excluding two smaller extreme outliers and †††excluding three smaller outliers.

Figure 3: Mean-item summated score values for the respondents from Finland and Norway for the four dimensions



In the box plots, the boundary of the box closest to zero indicates the 25th percentile (Q1, first quartile), a black line within the box marks the median, a black dot within the box marks the mean and the boundary of the box farthest from zero indicates the 75th percentile (Q3, third quartile). Interquartile range (IQR) was given by Q3–Q1. Whiskers above and below the box indicate the 'maximum' (Q3 + 1.5*IQR) and 'minimum' (Q1 + 1.5*IQR). Points above and below the whiskers indicate outliers outside the 'maximum' and 'minimum'. The width of the boxes is scaled to represent their sample size. Finland is displayed as white boxplots, while Norway is displayed as grey boxplots.

Teacher educators' overall perceptions

Overall, Figure 3 and Table 3 show that, collectively, Finland had relatively high mean-score values correlating to how they perceived and considered the four dimensions. There were relatively small differences in the variability in how teacher educators in Finland perceived the different dimensions, both within each statement and between statements.

Like Finland, Norway had relatively high mean-score values regarding how they perceived and considered the four dimensions collectively. However, Norway showed relatively large variation in the mean-score values of the respondents for all dimensions and some between-dimensions.

Teacher educators' perceptions of the four dimensions

The results are presented according to the four dimensions in Healey's model. Table 4 shows the results of the analysis performed for the different background variables for

each of the four dimensions. The similarities and differences between the countries are further presented after Table 4.

Table 4: Statistical tests for different background variables for the four quadrants

		Country	Type of academic degree	Experience with supervision of master`s theses	Participating in research groups	Nature of highest academic degree	Years in teacher education	Discipline
Research-led	Test	2017.5	3041	3321.5	846.5	3420.5	0.07	9.72
	p	.10	.19	.007*	.03	.007*	.39	.05
	Effect size	60%	56%	63%	64%	63%		0.07
Research-oriented	Test	1693.5	3427.5	3262.5	1696.5	3140.5 .11	0.07	10.92
	p	.95	.005*	.01*	.17	58%	.40	.03
	Effect size	50%	63%	62%	59%			0.07
Research-tutored	Test	2429	2904.5	3044.5	1854.5	3191	0.08	3.15
	p	.0002*	.44	.11	.03	.07	.33	.53
	Effect size	72%	54%	58%	65%	58%		0.02
Research-based	Test	2172	3027.5	3313	1840	3383	0.11	4.58
	p	.01*	.21	.007*	.03	.01*	.20	.33
	Effect size	65%	56%	63%	64%	62%		0.03

The following tests were used: the Wilcoxon rank-sum test (U) for *country*, *type of academic degree*, *experience in supervision of master's theses*, *participating in research groups* and *nature of highest academic degree*; the Spearman rank correlation ρ for *years in teacher education*; the Kruskal–Wallis chi-squared statistics (4 degrees of freedom) for *discipline*. Test = test statistics (for *years in teacher education* ρ is used); *p* = *p*-values given for the respective tests; effect size: common language effect size given as a percentage for the Wilcoxon rank-sum tests and epsilon-squared effect size for the Kruskal-Wallis chi-squared test. *indicates a significant *p*-value (at a significance level of $\alpha = 0.01$).

Research-led dimension

Within the research-led dimension, Finland and Norway showed relatively close central values in the distribution of mean scores (central tendency), and the data suggested a similar spread in mean-score values. Nonetheless, the range (minimum and maximum) was found to be larger for Norway.

The analysis indicated that the distribution of mean scores for teacher educators having experience with supervision (4.25) of master's theses was significantly different from those without experience (4.00; $p = .007$). Additionally, a significant difference was found between the median mean-score values of the two groups for the nature of the highest academic degree variable: education (4.25) and subject-specific discipline (4.00; $p = .007$). Finland's distribution was not found to be significantly different from Norway's distribution of the mean scores ($p = .10$).

Research-oriented dimension

Within the research-oriented dimension, Finland and Norway showed equal medians and close means in the mean-score values. The data suggested a similar spread in the mean-score values, although somewhat larger for Norway. As in the research-led dimension, the range was larger for Norway. The high standard deviation for Finland (compared to the other dimensions) was due to one extreme outlier.

The analysis indicated that the distribution of mean-score values for teacher educators having experience with supervision (4.25) of master's theses was significantly different from those not having this experience (4.00; $p = .01$). In addition, a statistically significant difference was found between the median mean-scores values of respondents with a PhD (4.50) and master's degree (4.00) as their highest degree ($p = .005$). Finland's distribution was not found to be significantly different from Norway's distribution of the mean scores ($p = .95$).

Research-tutored dimension

Within the research-tutored dimension, Finland and Norway showed different central values for the mean scores (the data indicated a larger difference than for the other dimensions). As in the former dimensions, the data suggested a similar spread in the mean score values, although larger for the Norwegian sample. The relatively high standard deviation for Norway was due to two extreme outliers. As for the other dimensions, the range was larger for Norway. The analysis indicated that Finland's distribution was significantly different from Norway's distribution of the mean scores ($p < .001$).

Research-based dimension

In the research-based dimension, Finland and Norway showed somewhat different central values, and the data suggested a similar spread (although larger for the Norwegian respondents) in the mean-score values. The relatively high standard deviation for Norway was due to three extreme outliers. However, the range was larger for Norway.

The analysis indicated that Finland's distribution was significantly different from Norway's distribution of the mean-score values ($p = .01$). This test also suggested that having experience in the supervision (4.50) of master's theses is significantly different from not having this experience (4.00; $p = .007$). Furthermore, for the variable nature of the highest academic degree, a significant difference in distributions between education (4.5) and subject-specific discipline was found (4.00; $p = .01$).

Discussion

This study investigated teacher educators' perceptions of scientifically designed teacher education in Finland and Norway, applied to the following research questions: How do teacher educators perceive scientifically designed teacher education and the research-led,

research-tutored, research-based, and research-oriented dimensions? Following these dimensions, we frame the results from teacher- to student-focused activities in our summary and discussion (Griffiths, 2004; Healey, 2005).

Summary of teacher- and student-focused activities

The results concerning the teacher-focused activities (research-led – emphasising the research content, and research-oriented – emphasising inquiry skills and a research ethos) indicate that Finland and Norway have similar views regarding scientifically-oriented teacher education. Teacher educators who had experience supervising master's theses presented statistically significant different mean scores compared to educators without this experience; the data reveal that those with experience have a more positive view of the dimensions.

In terms of the research-led dimension, a difference was found between teacher educators with education as their highest degree and those with a subject discipline as their highest degree, where education tended to score higher, that is, more positively. Regarding the research-oriented dimension, educators possessing a PhD tended to score more positively than those with a master's degree, and a difference in their distribution was found.

In the student-focused activities (the research-tutored dimension, focusing on research content, and the research-based dimension, emphasising research processes and problems), the central values showed larger differences between the two countries compared to the other dimensions, especially regarding the research-tutored. Significant differences were found between the two countries: Finland tended to score higher on these statements. For the research-based dimension, those having experienced supervising masters' theses were significantly different than educators without this experience, having a more positive view in the statements. In addition, educators with their highest academic degree (i.e., PhD) in education were different from those from a subject-specific background and more positive in the statements.

Discussion of the results

Compared to Norwegian educators, teacher educators in Finland have a more homogeneous view of scientifically designed teacher education. This result supports previous research, which pointed out teacher educators' strong identification with scientifically designed teacher education in Finland (Hökkä et al., 2017; Krokfors et al., 2011; Maaranen et al., 2019). Irrespective of the country, teacher educators with education degrees differ from those with a subject-specific background and tend to be more positive in both teacher- and student-focused activities (i.e., research-led and research-based). There might be several explanations for their positive statements: one is that those qualified in education tend to focus on the general phenomena of school, teaching and learning, and

attain a manifold view of the field, and another could be connected with a certain culture of the subject (Flores, 2018; Kansanen et al., 2017).

An explanation of the differences between the two countries regarding student-focused activities is that Finland has a long tradition of master's-based teacher education compared with Norway. These differences concern, for example, supervision, methodological courses and seminars, where students present and defend their master's theses (Kansanen, 2014; Niemi & Jakku-Sihvonen, 2006). Hence, Finnish teacher educators work in an established research environment (Maaranen et al., 2019; Tirri, 2014). The variation among the Norwegian respondents concerning the student-focused activities can be attributed to the ongoing merging processes, as teacher education institutions are attached to universities or university colleges with different research requirements (Smith & Flores, 2019). Another explanation may be the larger sample size and the overall differences in the background variables. Fewer Norwegian teacher educators have PhDs, and some have backgrounds in subject-specific research areas instead of (general) education. Norwegians also have less experience with master's supervision, which might make it challenging to reach a shared understanding concerning scientifically designed teacher education compared to the Finnish case.

A slightly greater fraction of the Finnish respondents had experience supervising masters' theses and a PhD as their highest degree. For the research-based dimension, Jakhelln and Lund's (2019) findings revealed that Norwegian teacher educators with limited experience felt insecure supervising a master's thesis. A teacher educator who is research literate establishes more confidence in the roles of researcher and teacher. The implications of scientifically designed teacher education, therefore, remain a challenge for the Norwegian system, demanding new competencies (Smith & Flores, 2019).

Limitations of the study

In the questionnaire based on Healey's model (2005), four statements about the four dimensions were constructed. The dilemma, however, was the concretisation of each dimension, constructing understandable statements for the respondents. The pilot study resulted in the revision of the statements on research-led teacher education to a more unidimensional construct. The internal consistency of the dimensions was thus found to be appropriate, and the four statements collectively mirrored the content of each dimension (George & Mallery, 2003; Nunnally, 1978). Experiences from this study provide an empirical foundation for deepening the questionnaire and further investigations into scientifically designed teacher education approaches.

Conclusion

The findings indicate overall positive and quite similar perceptions of scientifically designed teacher education in both Finland and Norway. The common views may relate to the fact that impulses and ideas from Finnish teacher education programmes have been

translated, modified, and incorporated into the Norwegian teacher education discourse (Hansén et al., 2014). Despite the similarities between the countries, differences were found, especially in dimensions concerning teacher-focused activities – particularly the research-tutored dimension. These similarities and differences can be understood in light of historical, societal and cultural similarities between the Nordic countries (Elstad, 2020; Hansén, 2015). The teacher educators' perceptions were more varied amongst the Norwegian respondents, which might, to some extent, be explained by the lower sample size of Finnish educators compared to the Norwegian sample and by the low homogeneity of the Norwegian compared to the Finnish respondents when it comes to background factors. Regardless of differences, the picture obtained shows that teacher educators' perceptions in Finland and Norway have slightly different nuances, although anchored in scientifically designed teacher education. This quantitative study offers a general overview and represents a first step in strengthening high-quality teacher education to ascertain a deeper and more nuanced understanding of teacher educators' perceptions of scientifically designed teacher education. Future research could collect a larger sample from several institutions in both countries, combined with in-depth oriented qualitative measures.

References

Alvunger, D., & Wahlström, N. (2018). Research-based teacher education? Exploring the meaning potentials of Swedish teacher education. *Teachers and Teaching, 24*(4), 332–349. https://doi.org/10.1080/13540602.2017.1403315

Baan, J., Gaikhorst, L., Noordende, J., & Volman, M. (2019). The involvement in inquiry-based working of teachers of research-intensive versus practically oriented teacher education programmes. *Teaching and Teacher Education, 84*, 74–82. https://doi.org/10.1016/j.tate.2019.05.001

Baan, J., Gaikhorst, L., & Volman, M. (2020). Stimulating teachers' inquiring attitude in academic and professional teacher education programmes. *European Journal of Teacher Education, 43*(3), 352–367. https://doi.org/10.1080/02619768.2019.1693994

BERA. British Educational Research Association. (2014). *The role of research in teacher education: Reviewing the evidence*. Interim Report of the BERA–RSA Inquiry. https://www.bera.ac.uk/wp-content/uploads/2013/12/BERA-RSA-Research-Teaching-Profession-FULL-REPORT-for-web.pdf?noredirect=1

Boone, H. N., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension, 50*(2).

Burn, K., & Mutton, T. (2015). A review of 'research-informed clinical practice' in initial teacher education. *Oxford Review of Education, 41*(2), 217–233. https://doi.org/10.1080/03054985.2015.1020104

Cochran-Smith, M., & Fries, K. (2008). Research on teacher education: Changing times, changing paradigms. In M. Cochran-Smith, S. Feiman-Nemser, J. McIntyre, & K. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts* (3rd ed., pp. 1050–1093). Routledge.

Cochran-Smith, M., Stringer Keefe, E., & Cummings Carney, C. M. (2018). Teacher educators as reformers: Competing agendas. *European Journal of Teacher Education, 41*(5), 572–590. https://doi.org/10.1080/02619768.2018.1523391

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297–334. https://doi.org/10.1007/bf02310555

Ellis, V., McNicholl, J., Blake, A., & McNally, J. (2014). Academic work and proletarianisation: A study of higher education-based teacher educators. *Teaching and Teacher Education, 40*, 33–43. https://doi.org/10.1016/j.tate.2014.01.008

Elstad, E. (2020). Lærerutdanninger i nordiske land [Teacher educations in the Nordic countries]. In E. Elstad (Ed.), *Lærerutdanning i nordiske land [Teacher education in the Nordic countries]* (pp. 17–66). Universitetsforlaget.

Esser, F., & Vliegenthart, R. (2017). Comparative research methods. In J. Matthes, C. S. Davis, & R. Potter (Eds.), *The International Encyclopedia of Communication Research Methods* (pp. 248–269). Wiley-Blackwell.

Finnish Advisory Board on Research Integrity. (2012). Responsible conduct of research and procedures for handling allegations of misconduct in Finland. Helsinki, Finland. https://tenk.fi/en/advice-and-materials/RCR-Guidelines-2012

Flores, M. A. (2018). Tensions and possibilities in teacher educators' roles and professional development. *European Journal of Teacher Education, 41*(1), 1–3. https://doi.org/10.1080/02619768.2018.1402984

General Data Protection Regulation (2016/679). Regulation of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC. (16/679). http://data.europa.eu/eli/reg/2016/679/oj

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Allyn & Bacon.

Goodwin, A. L., Smith, L., Souto-Manning, M., Cheruvu, R., Tan, M. Y., Reed, R., & Taveras, L. (2014). What should teacher educators know and be able to do? Perspectives from practicing teacher educators. *Journal of Teacher Education, 65*(4), 284–302. https://doi.org/10.1177/0022487114535266

Griffiths, R. (2004). Knowledge production and the research – Teaching nexus: The case of the built environment disciplines. *Studies in Higher Education, 29*(6), 709–726. http://doi.org/10.1080/0307507042000287212

Grissom, R. J., & Kim, J. J. (2012). Effect sizes for research: Univariate and multivariate applications (2nd ed.). Routledge.

Hansén, S-E. (2015). Utblickar på reformer av lärarutbildning och utbildningssatsningar i Norden [Looking at reforms of teacher education and educational initiatives in the Nordic region]. *Kasvatus, 46*(4), 389-395.

Hansén, S-E. & Sjöberg, J. & Eilertsen, T. V. (2014). Finske reformidéer i norsk lærerutdanningsdiskurs [Finnish reform ideas in Norwegian teacher education discourse]. In K.A. Røvik, T.V. Eilertsen & E. Moksnes Furu (Eds.), *Reformideer i norsk skole. Spredning, oversettelse og implementering [Reform ideas in Norwegian schools. Dissemination, translation and implementation]* (pp. 167–193). Cappelen Damm Akademisk.

Harrison, J., & McKeon, F. (2010). Perceptions of beginning teacher educators of their development in research and scholarship: Identifying the 'turning point' experiences. *Journal of Education for Teaching, 36*(1), 19–34. https://doi.org/10.1080/02607470903461968

Healey, M. (2005). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Ed.), *Reshaping the university: New relationships between research, scholarship and teaching* (pp. 67–78). Open University Press.

Hökkä, P., Vähäsantanen, K., & Mahlakaarto, S. (2017). Teacher educators' collective professional agency and identity – Transforming marginality to strength. *Teaching and Teacher Education, 63*, 36–46. https://doi.org/10.1016/j.tate.2016.12.001

Izadinia, M. (2014). Teacher educators' identity: A review of literature. *European Journal of Teacher Education, 37*(4), 426–441. https://doi.org/10.1080/02619768.2014.947025

Jakhelln, R., & Lund, T. (2019). Masterveiledning – en utfordring for grunnskolelærerutdanningen [Supervision at the master's level – A challenge for the teacher education for primary and secondary school]. *Uniped*, *42*(2), 168–179. https://doi.org/10.18261/issn.1893-8981-2019-02-05

Jenkins, A., & Healey, M. (2015). International perspectives on strategies to support faculty who teach students via research and inquiry. *Council on Undergraduate Research Quarterly*, *35*(3), 31–37.

Kansanen, P. (2014). Teaching as a master's level profession in Finland: Theoretical reflections and practical solutions. In O. McNamara, J. Murray, & M. Jones (Eds.), *Workplace Learning in Teacher Education. Professional Learning and Development in Schools and Higher Education* (pp. 279–292). Springer Science-Business Media Dordrecht.

Kansanen, P., Hansén, S.-E., Sjöberg, J., & Kroksmark, T. (2017). Vad är allmändidaktik? [What is general didactics?] In S.-E. Hansén, & L. Forsman (Eds.), *Allmändidaktik – Vetenskap för Lärare* [General didactics–Science for teachers]. Studentlitteratur.

Kelley, T. (1935). An unbiased correlation ratio measure. *Proceedings of the National Academy of Sciences*, *21*(9), 554–559. https://doi.org/10.1073/pnas.21.9.554

Klieme, K., Lehmann, T., & Schmidt-Borcherding, F. (2020). Fostering professionalism and scientificity through integration of disciplinary and research knowledge. In T. Lehmann (Ed.), *International perspectives on knowledge integration: Theory, research, and good practice in pre-service teacher and higher education* (pp. 78–107). Brill.

Krokfors, L., Kynäslahti, H., Stenberg, K., Toom, A., Maaranen, K., Jyrhämä, R., Byman, R., & Kansanen, P. (2011). Investigating Finnish teacher educators' views on research-based teacher education. *Teaching Education 22*(1), 1–13. https://doi.org/10.1080/10476210.2010.542559

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, *22*(140), 1–55.

Maaranen, K., Kynäslahti, H., Byman, R., Jyrhämä, R., & Sintonen, S. (2019). Teacher education matters: Finnish teacher educators' concerns, beliefs, and values. *European Journal of Teacher Education*, *42*(2), 211–227. https://doi.org/10.1080/02619768.2019.1566317

McGraw, K. O., & Wong, S.P. (1992). A common language effect size statistic. *Psychological Bulletin*, *111*, 361–365. https://doi.org/10.1037/0033-2909.111.2.361

Ministry of Education and Research. (2010). *Forskrift om rammeplan for grunnskolelærerutdanningene for 1.-7. trinn og 5.-10. trinn* [Regulations Relating to the Framework Plan for Primary and Lower Secondary Teacher Education for Years 1–7 and 5–10]. https://lovdata.no/dokument/SF/forskrift/2010-03-01-295

Munthe, M., & Rogne, M. (2015). Research based teacher education. *Teaching and Teacher Education*, *46*, 17–24. https://doi.org/10.1016/j.tate.2014.10.006

Nasser-Abu Alhija, F. M., & Majdob, A. (2017). Predictors of teacher educators' research productivity. *Australian Journal of Teacher Education*, *42*(11), 34–51.

Niemi, H., & Jakku-Sihvonen, R. (2006). Research-based teacher education. In R. Jakku-Sihvonen, & H. Niemi (Eds.), *Research-based teacher education in Finland. Reflections by Finnish teacher educators* (pp. 31–50). Research in Educational Studies, 25.

Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). McGraw-Hill.

Ping, C., Schellings, G., & Beijaard, D. (2018). Teacher educators' professional learning: A literature review. *Teaching and Teacher Education*, *75*, 93–104. https://doi.org/10.1016/j.tate.2018.06.003

Puustinen, M., Santti, J., Koski, A., & Tammi, T. (2018). Teaching: A practical or research-based profession? Teacher candidates' approaches to research-based teacher education. *Teaching and Teacher Education*, *74*, 170–179. https://doi.org/10.1016/j.tate.2018.05.004

R Core Team (2019). *R: A language and environment for statistical computing. R Foundation for Statistical Computing*. Vienna, Austria. https://www.R-project.org/

Smith, K., & Flores, M. A. (2019). The Janus faced teacher educator. *European Journal of Teacher Education*, *42*(4), 433–446. https://doi.org/10.1080/02619768.2019.1646242

Tirri, K. (2014). The last 40 years in teacher education. *Journal of Education for Teaching, 40*(5), 600–609. https://doi.org/10.1080/02607476.2014.956545

Vanassche, E., Rust, R., Conway, P. F., Smith, K., Tack, H., & Vanderlinde, R. (2015). InFo-TED: Bringing policy, research, and practice. Together around teacher educator development. In C. Craig, & L. Orland-Barack (Eds.), *International teacher education: Promising pedagogies (Part C). Advances in research on teaching, Volume 22C* (pp. 341–364). Emerald Group Publishing.

Willemse, T. M., & Boei, F. (2013). Teacher educators' research practices: An explorative study of teacher educators' perceptions on research. *Journal of Education for Teaching, 39*(4), 354–369. https://doi.org/10.1080/02607476.2013.797292