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# Research-based teacher education in Norway – a longitudinal perspective

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## ABSTRACT

Research has been highlighted as a key dimension in the development of teacher education quality. However, there are different understandings of how research is and should be linked to teacher educators' competence. We examine changes in teacher educators' attitudes towards research-based teacher education in Norway by comparing results from 2008 with those from 2021. Teacher educators' attitudes have changed towards a more research-positive approach. The changes are to some extent related to more research-experienced staff, but the positive attitudes towards research-based teacher education seem also to be a matter of culture and teacher identity.

## 1. Introduction

Research has been highlighted as a key dimension in the development of teacher education quality (Menter & Flores, 2021). However, the idea is controversial, and there are different understandings of how research is and should be linked to teacher educators' competence. Research literacy has been introduced as an inclusive perspective on the role of research-based teacher education, defined as 'the ability to judiciously use, apply and develop research as an integral part of one's teaching' (Evans et al., 2017, p. 404). The aim is that teacher candidates should not just be research-informed consumers, but they should also be equipped to conduct their own research to investigate and explore interventions and educational practices (Menter & Flores, 2021).

Different policy trends have been identified in the literature. On one hand, more solid, research-based teacher education is emphasized; on the other hand, teacher education programmes have moved in the direction of educational reforms in general, focusing on accountability-oriented and standards-based approaches (Darling-Hammond & Lieberman, 2012; Kelchtermans et al., 2018; Kosnik et al., 2020; Smeby, 2015). Current research presents idiosyncratic country challenges emerging from these tensions (Darling-Hammond & Lieberman, 2012). Such differences in national policy contexts have significant implications for the extent to which teacher education has become more research based. There are also important challenges on individual and local levels, as tensions, resistance and dilemmas are identified within organisational cultures that tend to be conservative (Vieira et al., 2018).

Teacher education in Norway is an interesting and relevant case study for the purpose of identifying patterns of cooperation and conflict around research use. While other countries such as England has developed towards a teacher education program clearly founded in the practical realities of schools, Norwegian teacher education has moved towards a more research-focused teacher education program, that is also focused on professional relevance (Rogne & Munthe, 2017). Over the past two decades, the Norwegian education policies have emphasised a specific combination of factors. The focus is on extending teacher education and providing

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further education courses to strengthen professional knowledge bases, while increasing accountability for student learning outcomes (Mausethagen & Smeby, 2016). Several education reforms have been implemented nationally to strengthen the research basis of the curriculum and increase teacher educators' formal research competence and productivity. Concurrently, structural reforms have changed the landscape of higher education, including teacher education, bringing in new tensions and demarcations, as well as reinforcing old ones.

Although large changes have been undertaken, the relationship between policy and practice is by no means straight forward. It has been pointed out for a long time (see e. g. Goodlad, 1979) that the transformation from the ideological ideas, through the formal guidelines and all the way down to the operational and practical performance is complicated and bears a large risk of detachment and decoupling from the levels above. This understanding of missing connections between stated policies and practical work is also a key insight in institutional theory (see e.g. Meyer & Rowan, 1977; Thornton & Ocasio, 2008). Moreover, it has been pointed out that there is a need for a more non-linear understanding of the relationship between reforms and supra-national and national ideological shifts and the performed enacted curriculum at the micro- and nano-level within the organisations (Priestley & Biesta, 2013; Priestley et al., 2021). We would further argue that in order to more fully understand how policy changes potentially leads to changes within teacher education, it is necessary to also investigate changes over time.

Based on cross-sectional survey data from teacher educators in Norway, collected in 2008 and 2021, we aim to explore the factors related to the teacher education faculty staff's emphasis on research-based teaching, as well as how such emphasis might have changed over time. Although we do not claim a causal relation between policy reforms and faculty members' emphasis on research-based teaching, we think that it is appropriate to present the Norwegian policies on teacher education in some detail in this paper, before turning to the international research on research-based teacher education and how it is understood and examined.

### 1.1. The policies of teacher education in Norway

Teacher educators' competence and identity are not uniform, whether within or between countries. It has been argued that there is a lack of a shared understanding of what teacher educators' competence actually is and should be (Murray & Kosnik, 2011; Snoek et al., 2011; Ulvik & Smith, 2018).

In Norway, different educational reforms in teacher education and in higher education in general have highlighted this division within and among teacher education programmes. The most prominent large-scale reforms have been the structural changes in 1994 and from 2015 and onwards. In 1994, 98 smaller regional colleges with predominantly vocationally oriented programmes (e.g., teaching, nursing, etc.) were merged into 26 larger units. The merger and its consequences have been interpreted and analysed in terms of academic drift and increased emphasis on research-based knowledge and the substitution of vocationally grounded standards with academic standards (Kyvik & Lepori, 2010; Smeby, 2015). Furthermore, the structural changes in 2015, where voluntary mergers between higher education institutions were encouraged, also meant that traditional seminar-based traditions of teacher education programmes in university colleges again clashed with academic traditions in universities. One example was when the University College in South-Trøndelag merged with the Norwegian University of Science and Technology in 2016. The result was the largest teacher education institution in Norway with built-in tensions between the master's programmes based on the traditional university disciplines and the general teacher education programmes at the university college (Frølich & Stensaker, 2021).

Norwegian teacher education has been the direct focus of national education policies for a long time, not just as a part of larger structural changes. As stated by Smepland (2018), different stakeholders and actors have defined narratives of what characterises a "good" teacher education and what it takes to get there from the starting point of a not-so-good teacher education. The most important phenomena examined in this article are the changes that have taken place after 2000. Around 2000, the discussion focused on whether the teacher education programmes should refer to the general *bildung* aspects of schools (general teacher education) or be more directed to the specific teaching tasks in schools (primary school teacher education). The strategic unit for teacher education programmes in the Norwegian Association of Higher Education Institutions (UHR) decided for the former. However, only a few years later, the debate on teacher education would be fueled by a national evaluation of the teacher education programmes (Hansén et al., 2006).

The evaluation sparked a large debate, as it pointed to variations in the teacher education programmes' quality and structure and paved the way for several reforms in subsequent years. The lack of a strong research orientation in the teacher education programmes was emphasised. It also raised the question of whether some of the smaller teacher education programmes were perhaps not scientifically strong enough to provide adequate research-based education. It could be added that the evaluations of higher education programmes by the Norwegian Agency for Quality Assurance in Education (NOKUT) also ignited a more scientific debate on what research-based education would really entail (e.g. Kyvik & Vågan, 2014; Universitets- og høyskolerådet, 2010).

As a follow-up, a government white paper (St.meld. nr. 11 (2008–2009)) strengthened the emphasis on research in teacher education programmes, especially the student teachers' ongoing contacts with their higher education teaching staff's research projects. It was argued that an increase in the formal competence of the teaching staff should be expected, as many had started or were finishing their PhD degrees or the programmes to qualify as senior lecturers. A change from a four-year to a five-year teacher education program was argued to be premature at that point, as the research foundation was not strong enough to support a master's degree. A transition towards a master's degree in teacher education would require systematic competence development and recruitment among the staff to be realistic.

However, only a short time later (2010), teacher education programmes underwent a reform, from the general teacher education program to binary programmes – one for grades 1–7 and the other for grades 5–10. To support this transition, an evaluation group was established, which delivered five reports until 2015. The overall conclusion in 2015 was that the research-based orientation of teacher education programmes had developed in a positive direction, although a continued emphasis on strengthening the research orientation

was needed. The professional relevance and practice orientation were perceived as successful and positive, while more work towards internationalization was needed, among other issues (Munthe & Rogne, 2015).

In 2014, the government launched the strategy 'Promotion of the status and quality of teachers' (Lærerløftet). Public officials argued that teachers' professional knowledge base needed to be strengthened (Ekspertgruppa, 2016). The government also introduced stricter formal requirements for teaching certain subjects in schools, described plans and goals for further and continuing education of both teachers and school leaders, as well as more systematic mentoring of novice teachers. In the last chapter of the government report, they argued that a five-year master's degree should be the main model for teacher education. The transition to the five-year master's program started in 2017, meaning that the first batch of students (except those who finished a pilot program earlier) graduated in 2022.

As indicated by the vertiginous timeline of reforms, evaluations and structural changes presented above, a range of policy efforts has been initiated in Norway to strengthen the knowledge base and research use in teaching, from a point where weak relations to extended networks had been identified and argued to be a challenge for educational quality (Mauseithagen & Smeby, 2016). The proportion of faculty members with a PhD degree has increased from 19% in 2008 to 48% in 2021, and the proportion of professors increased from 2% to 13% over the same period (Holmeide, 2022). Available national data also indicate that scientific publishing within these programmes has increased, especially towards the end of the period.<sup>1</sup> However, there is a lack of knowledge on whether all these reforms and efforts have stimulated faculty members' emphasis on research-based education.

### 1.2. The hybrid positioning of teacher educators

The policy-driven focus on research-based education has led to a paradigm shift in many countries. The extent to which teacher educators cope with these new expectations is less explored. It is stated that teacher educators comprise an under-researched occupational group (Murray, 2016; Smith & Flores, 2019), but challenges related to research-based teacher education have been addressed to an increasing extent in recent years as part of the growing, albeit fragmented literature on teacher educators' work, professionalism, identity and learning (Kelchtermans et al., 2018; Menter & Flores, 2021; Ping et al., 2018; Smith & Flores, 2019). In a Norwegian context, there are also interesting studies on national and local initiatives in developing research-based teacher education, which seems to be quite successful (Afdal & Spernes, 2018; Jakhelln et al., 2021; Munthe & Rogne, 2015; Ulvik & Smith, 2019).

The increased expectations and requirements imply a hybrid position, which is often challenging, due to tensions between teaching and research (Hill & Haigh, 2012; Kelchtermans et al., 2018; Smith & Flores, 2019). Teacher educators are expected to be not only research informed but also active producers of research. According to the literature, the latter is particularly challenging due to the lack of formal research qualification, time, funding and senior research colleagues, as well as a poor support culture (Alhija & Majdob, 2017; Czerniawski et al., 2018; Hill & Haigh, 2012; Kosnik et al., 2020; Lunenberg et al., 2014; MacPhail & O'Sullivan, 2019; Oancea et al., 2021; Ping et al., 2018; Williams & Coles, 2007). Based on a comparative cross-country survey, it is reported that not all teacher educators think that they are competent to conduct research and that there is a need for increased research and academic writing skills (Czerniawski et al., 2017). The need for developing teacher educators' learning and professionalism is emphasised (Goodwin, 2021; Menter & Flores, 2021; Ping et al., 2018).

Research-based teacher education is not just a matter of encouraging and stimulating faculty members' research activity; it is also a claim for relevance. The research should provide a basis for developing the knowledge base for teachers and teacher education. Teacher educators need to relate their research to the field of practice and develop a strong relation between them. It is even argued that there are contradictory and clashing epistemological beliefs between teacher educators and teachers (Joram, 2007, 2020). The lack of coherence between theory and practice is a great challenge, and there is also a potential lack of alignment between the two main activities of teacher educators – teaching and conducting research (Korthagen, 2010; MacPhail et al., 2019). It is also reported that the research orientation is less obvious in pedagogical-content courses (what to teach) than in pedagogical courses per se (how to teach) (Krokfors et al., 2011). However, studies on the implementation of research in teacher education indicate that teacher educators have a positive attitude towards research (Ben-Asher, 2019).

In Norway, studies indicate that teacher educators' understanding of professional knowledge in research-based education seems to be split into several dichotomies, such as educational sciences versus subject sciences, research versus teaching, and collaboration versus autonomy (Jegstad et al., 2021). There is an overall tension between a research-based and profession-oriented curricula (Afdal, 2017), where teacher educators tend to emphasize research perspectives in their own subjects, rather than developing students' general R&D competence (Thorsen & Lundberg, 2022). Munthe and Rogne (2015) find that initial teacher education programs are research oriented but emphasizes student involvement and engagement to a less extent than teacher-led activities. Jakhelln et al. (2021) have also pointed out that the lack of coherence between theory and practice is a returning question also in Norway. The campus and schools are often considered two different cultures (Ulvik & Smith, 2019).

Kelchtermans et al. (2018) emphasize that teacher educators comprise a particular group of professionals with particular responsibilities, expertise and commitments (p. 121). A fundamental dual characteristic of teacher educators' expertise is that it is not a particular subject or discipline that is taught but how to teach the subject – the didactics. Therefore, there is a need to find a balance between research and teaching (Vanassche & Kelchtermans, 2016). The competence gap and the tension between research and teaching raise the question of whether all teacher educators should be expected to be producers of research. On one hand, a study on

<sup>1</sup> The data are available for download at <https://dbh.hkdir.no/tall-og-statistikk/statistikk-meny/publisering/statistikk-side/10.7> (accessed March 3, 2022).

Norwegian teacher educators reported that both research-active and non-active faculty emphasised research-based education almost to the same extent (Kyvik et al., 2015). On the other hand, it is claimed that it is insufficient for teacher educators to be consumers of research. Research-based education implies that teacher educators should be able to conduct practice-oriented research, teach the appropriate and relevant research methods to student teachers and supervise their research assignments (Smith & Flores, 2019). They also suggest that research-active faculty and teacher educators with experience in teaching school children might learn from each other and jointly find ways to improve practice, as they share the same goals.

To strengthen the emphasis on research in teacher education programmes, the development of teacher educators' identity and agency is central (Hökkä et al., 2012; Izadinia, 2014). A decade after the transition from purely pedagogical institutions into academic research institutions in Israel, it was reported that teacher educators accepted the new representation of the centrality of combining research and teaching, but few teacher educators identified with the new representation on a personal level (Ben-Asher, 2019). Even in Finland, it was reported that although teacher candidates appreciated the research-based approach, they valued practical orientation more highly than theoretical elements and did not always recognize the relevance of theory (Puustinen et al., 2018).

As highlighted in the Introduction section, a range of policy efforts has been initiated in Norway to strengthen the knowledge base and research use in teacher education. Organisational cultures tend to be conservative, however (Vieira et al., 2018), and there is a potential gap between the ideological supralevel, the stated guidelines and the attitudes and actions of teacher educators themselves (Priestley et al., 2021). Therefore, we explore whether teacher educators' emphasis on research-based teaching has changed between 2008 and 2021. Moreover, based on the above literature review, we explore whether the following factors relate to teacher educators' emphasis on research-based teaching: research competence; time for research (percentage of the teacher educator's position allocated to R&D activities), extent of experience teaching in universities, teacher education, and primary education; professional identity; and disciplinary background, as well as age and gender.

### 1.3. Data and methods

This article is based on surveys among teacher educators, first conducted in 2008 as part of a large research project investigating the relation between teacher education and work in schools, called *Novice Teachers and How They Cope* (for a detailed presentation, see, e.g., Caspersen (2013)). In the winter of 2008, a link to the online survey was sent by e-mail to 19 teacher education institutions in Norway. It was distributed to all employees who taught student teachers, regardless of the employees' formal position. A teacher educator was thus defined as someone who, knowingly or unknowingly, teaches student teachers in general Norwegian teacher education. A total of 545 teacher educators responded, representing an overall response rate of 49%.

In the spring of 2021, parts of this survey were replicated to assess long-term changes among teacher educators, with the addition of some new themes. Due to the large variation in the structural organization of teacher education institutions, it was difficult to obtain a good overview of how many teacher educators to include in the survey. Out of the 1055 invited, 27% responded, but there are good reasons to believe that the actual number of qualified invited respondents (i.e., general teacher educators in either the grades 1–7 program or the grades 5–10 program) was substantially lower than the number of recipients and that the response rate among the actual target group was higher.

The variables included in the analyses are presented in Table 1.

Research-based teaching is an additive index based on five statements on a scale from 0 = never to 5 = very often (see Fig. 1). A factor analysis confirms that the statements comprise one dimension, and Cronbach's alpha is 0.839.

The gender composition among teacher educators has changed from a close to equal distribution in 2008, to 64/36% distribution in 2021, with a majority of female teacher educators. The gender composition now matches the composition of the student group, which has been stable on about 70% female and 30% men throughout the period.<sup>2</sup>

The percentage with a PhD has more than doubled, from 19,3% to 48, 2%. At the same time the teacher educators are now younger, indicating that a large shift in the composition of teacher educators have taken place in the period. There is also a small tendency towards a similar shift regarding experience, where the staff in 2021 has less experience from higher education, less experience from teacher education, but somewhat more experience from work in schools. One possible explanation is that recruitment into master-programs and subsequently PhD-programs has been taken from teachers already working in schools.

Analyses of the variance inflation factor (VIF) indicate no multicollinearity issues of significance in the regression analyses performed.

The questions on educational background were somewhat different in 2021 and 2008. However, if we look at the broader picture and analyze changes in educational background from 2008 to 2021, there has been a sharp increase in staff with backgrounds from social sciences and pedagogy (almost 45% in 2021, compared to 24% in 2008%, with a similar decrease in staff with background from STEM-disciplines (from 23% to 10%), and humanities (from 40,5% to 33%).

As stated earlier, the changes matches the trends found in national statistics, supporting the overall validity of the material despite low response rates.

<sup>2</sup> All national statistics are taken from the open register of national statistics for higher education, accessible for all at <https://dbh.hkdir.no/> (accessed 12.008.2022)

**Table 1**  
Descriptive statistics.

Variables	Description	Female			Male							
		2008	2021	2021	2008	2021	2021					
Gender:	Male/female			51%		49%						
PhD	PhD as highest level of education			64%		36%						
Age	Age grouped in five-year intervals			48,2%								
Percentage of position for R&D	'What percentage of your position is allocated to R&D activities this academic year?' (10% intervals)											
Years employed in higher education	'Number of years you have worked in universities/ university colleges'		Never	Less than 1 year	1-5	6-10	11-20	21-30				
		2008		3,2	20,0	23,7	34,8	11,1				
		2021		1,3	19,1	29,9	31,6	15,2				
Years employed in teacher education	'Number of years you have primarily worked on educating student teachers/ teacher training'	2008	4,5	5,2	30,6	22,8	26,3	6,6				
		2021		7,4	31,7	29,1	22,2	9,6				
Years employed in primary education	'Number of years you have worked with primary and/or secondary school (lower and upper: grades 1-13) education'	2008	19,5	8,8	30,5	14,5	20,0	6,1				
		2021	13,5	9,2	25,3	17,9	23,6	9,6				
Identity as a teacher/researcher	'To what extent do you see yourself as a teacher/researcher? Scale from 0 = 0% teacher, 100% researcher, 10= 100% teacher, 0% researcher'											
	Scale	0	1	2	3	4	5	6	7	8	9	10
	%	0,4	0,4	0,9	3,5	4,8	27,0	13,5	17,8	16,1	12,2	3,5

**2. Results**

The teacher educators were asked to assess the extent to which they emphasised various aspects of research-based teaching. Fig. 1 shows that the averages for all aspects have increased significantly from 2008 to 2021. While there seems to be a hierarchy with respect to which aspects are most often emphasised in 2008, these differences are less clear in 2021. The extent to which the teacher involves students in research and development projects during their studies is the least emphasised in both 2008 and 2021, however.

Based on the summative index on research-based education, three regression analyses have been conducted (Table 1). The first analysis is based on the results from the 2008 and the 2021 surveys combined. Gender (being male) and age are negatively related to the emphasis on research-based teaching, holding a PhD degree is not related, while the percentage of position for R&D is positively related. The number of years of employment in higher education institutions, as well as primary schools, is positively related, while the number of years of employment in teacher education institutions is negatively related. The differences between 2008 and 2021 (identified by the variable panel) are also significant. The explained variance of the model is reasonable ( $R^2$  adj. = 0.234).

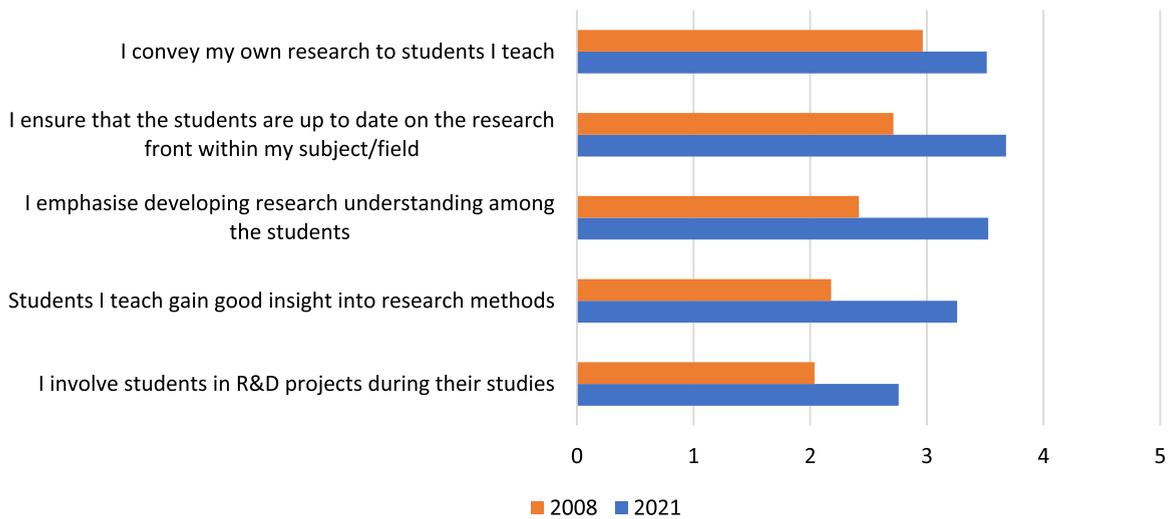


Fig. 1. Primary teacher educators' emphasis on different aspects of research-based teaching in 2008 and 2021. Averages on a scale from 0 = never to 5 = very often.

To explore whether the relations between research-based teaching and the independent variables are similar in the two years, separate analyses have been conducted. The second analysis, of the 2008 data, alone reveal patterns identical to those of the analysis based on the combined 2008 and 2021 data. However, the third analysis, based on the 2021 data alone, differ from those of 2008 (and the combined data). Gender is now negatively related to emphasis on research-based teaching, while the percentage of the teacher educator's position allocated to R&D activities and the number of years of employment in higher education are still positively related. In the 2021 analyses, age is not significant, while holding a PhD degree is positively related to emphasis on research-based teaching in 2021 but not in 2008. The number of years of employment in teacher education as well as in primary school is insignificant in 2021, different from 2008. The explained variance of the model is also higher in 2021 data ( $R^2$  adj. = 0.195) than in 2008 data ( $R^2$  adj. = 0.108).

The 2021 survey includes additional variables that were not in the 2008 survey. The identity variable and disciplinary background are of particular interest in the present study. Disciplinary background was also included in the 2008 survey but operationalised differently than in 2021 and unsuitable for comparison over time. However, including this variable in the analyses of 2021 data, does not change the results in any significant way, except for gender becoming non-significant in the analyses, and disciplinary background furthermore has no significant effect on the dependent variable (not shown in table). The teacher educators were asked about the extent to which they considered themselves researchers or teachers on an 11-point scale (from 0 = 0% teacher, 100% researcher to 10

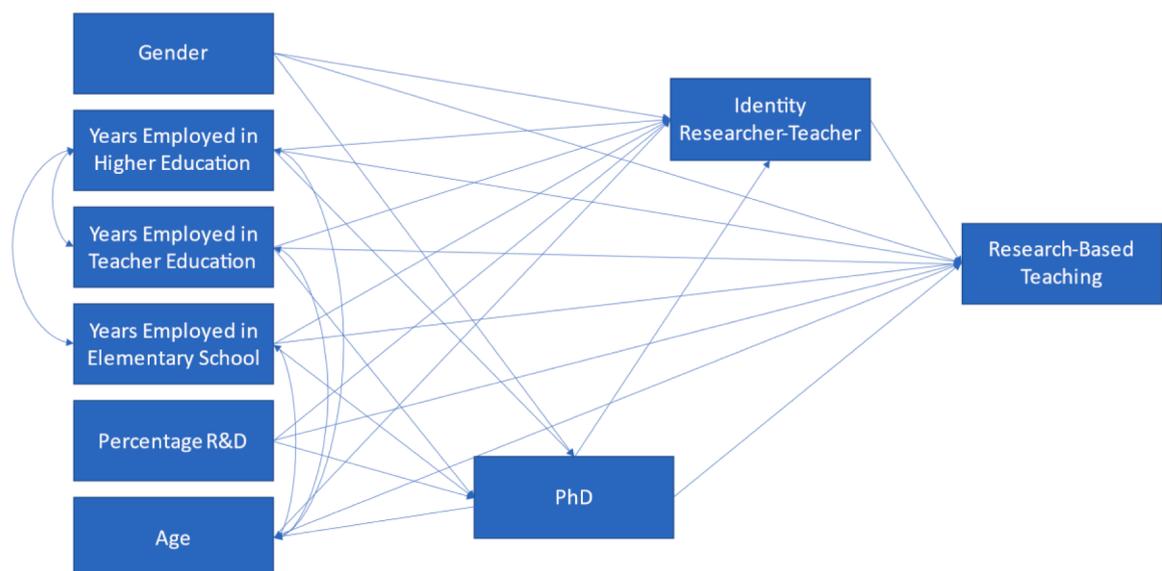


Fig. 2. Structural regression model.

= 100% teacher, 0% researcher). To analyze the relations between the background variables, the identity variable and the teacher educators' emphasis on research-based teaching, we have conducted a path-regression analysis (using the structural equation module (SEM) module in Stata). As the analysis is based on cross-sectional data, it should not be interpreted causally, although we will use the traditional wording of direct and indirect effects in our presentation of results.

The path-regression model in Fig. 2 shows that holding a PhD degree has a direct effect on attitudes towards research-based teaching, as well as an indirect effect through teacher educator's identity as a researcher. We also find that identity as a teacher-researcher has a negative relation to research-based teaching, meaning that those who identify themselves as teachers more than researchers emphasize research-based teaching to a lesser extent. We find that gender has the same negative relation to research-based teaching, meaning that men have a less positive attitude towards research-based teaching than women. The total effects of experience and age found in Table 3 are similar to those found in Table 2, except that we now also identify an indirect relation through the teacher-researcher identity and holding a PhD degree. We also find that the percentage of the teacher educator's position allocated to R&D activities has an indirect effect on research-based teaching but not a direct effect, as one might believe based on the regression shown in Table 2.

### 2.1. Paths towards research-based teaching

Our analyses show that the emphasis on research-based teaching among teacher educators has increased significantly from 2008 to 2021. This holds for all aspects included in the survey. While the old national curriculum from 2003 stated that the teacher education should be vocational, based on primary school teachers' practice, the new curriculum emphasised the various aspects of research-based education (Jegstad et al., 2021; Rogne & Munthe, 2017). The development of research competence, time for research, and research output have also been emphasised (Messel & Smeby, 2017). Our first regression analysis shows that the increase in the emphasis on research-based education is evident also when faculty members' research competence (PhD) and time for research are included in the analyses. The separate analyses of the 2008 and the 2021 data show that the relations between the independent variables and the emphasis on research-based teaching differ across time. Finally, the path model based on the 2021 data indicates that some of the relations are mediated through holding a PhD degree and through identity as a teacher or a researcher.

Based on the literature, it could be hypothesised that teacher educators with a background in education could more easily draw on their research and familiarity with the research field in their teaching (Krokfors et al., 2011). This is not confirmed in our analysis, it is rather identity towards the researcher-role in teaching or the practitioner role that seems to be important for how they understand the centrality of research, and identity is in itself formed by experience and training as researcher (holding a Ph.D) (as discussed by e.g. Hökkä et al., 2012, Izadinia, 2014). However, as our operationalisation of identity as teacher or researcher is based on a single variable, future research should study in more detail the concept of teacher/researcher identity, to explore the relationships further.

The separate regression analyses show that some of the independent variables are significantly related to the emphasis on research-based teaching in 2008 as well as in 2021; gender (being male) and age are negatively related in both years, while time for R&D and the number of years of employment in higher education are positively related. The reason why gender is related to the dependent variable is not easy to interpret. Most studies have found that in higher education in general, men tend to be more active in research than women (Fox & Colatrella, 2006; Healey & Davies, 2019). However, a study on teacher educators' research productivity has found that gender is not significantly related to it (Alhija & Majdob, 2017). Age is easier to interpret. It is reasonable to assume that younger teacher educators have adapted to the changes in expectations about their professional competence to a higher extent than older faculty members. We also find that the effect of age is mediated through holding a PhD degree. Time for R&D is reported to be an important factor for improving teacher educators' research capacity (e.g. Smith & Flores, 2019). Moreover, the number of years of experience in higher education is also positively related to the said factor at both moments. This finding seems reasonable since such experience provides more self-confidence and tends to be correlated with various research activities that the teacher educators may draw on in their teaching. The significance of years of experience in higher education modifies the negative relation of age.

Research competence (PhD) is significantly related to the emphasis on research-based teaching in 2021 but not in 2008. Two

**Table 2**  
Primary school teacher educators' emphasis on research-based teaching in 2008 & 2021, 2008 and 2021. Ordinary least squares (OLS) regression. Unstandardised regression coefficients (B) and standard error (SE) in parentheses.

	2008 & 2021		2008		2021	
Constant	1.345 (0.203)	***	2.144 (0.213)	***	2.409 (0.112)	***
Gender (male)	-0.268 (0.075)	***	-0.281 (0.098)	**	-0.221 (0.265)	*
Age	-0.060 (0.026)	*	-0.073 (0.035)	*	-0.034 (0.037)	
PhD	0.149 (0.091)		0.040 (0.128)		0.281 (0.125)	*
Percentage of the teacher educator's position allocated to R&D activities	0.111 (0.018)	***	0.107 (0.023)	***	0.116 (0.031)	***
Years employed in higher education	0.262 (0.058)	***	0.282 (0.075)	***	0.212 (0.09)	*
Years employed in teacher education	-0.101 (0.048)	*	-0.127 (0.059)	*	-0.017 (0.081)	
Years employed in elementary school	0.100 (0.029)	***	0.114 (0.038)	**	0.073 (0.042)	
Panel (2021 = 1)	0.687 (0.084)	***				
R <sup>2</sup> adj.	0.234		0.108		0.195	
N	662		438		224	

\*= $p > 0,05$ ; \*\*= $p > 0,01$ ; \*\*\*= $p > 0,001$ .

**Table 3**

Direct, indirect and total effects of variables on research-based teaching.

Independent variables	Research-based teaching					
	Direct effects		Indirect effects		Total effects	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
PhD	<b>0,33</b>	0,00	<b>0,17</b>	0,01	<b>0,49</b>	0,00
Identity as researcher/ teacher	<b>-0,19</b>	0,00	-	-	<b>-0,19</b>	0,00
Gender	<b>-0,34</b>	0,00	-0,03	0,36	<b>-0,37</b>	0,00
Age	-0,03	0,22	<b>-0,02</b>	0,05	<b>-0,05</b>	0,02
Years employed in higher education	0,02	0,79	<b>0,14</b>	0,00	<b>0,16</b>	0,00
Years employed in teacher education	<b>0,09</b>	0,02	<b>-0,07</b>	0,02	0,02	0,46
Years employed in elementary school	-0,01	0,60	0,00	0,68	-0,01	0,74
Percentage of the teacher educator's position allocated to R&D activities	0,00	0,97	<b>0,10</b>	0,00	<b>0,10</b>	0,00

reasons might be that the formal requirements and expectations for a PhD degree have increased over the period and that most research-active teacher educators in 2008 did not hold a PhD degree (Kyvik & Vågan, 2014). The findings presented in Table 1 show a change from about 20% (2008) to 50% (2021) of teacher educators holding a PhD degree, a change that supports the above-mentioned assumptions. Based on the same 2008 data as we draw on in the present article, Kyvik and Vågan (2014) conclude that the faculty's research activity seems to relate only to a limited extent to their emphasis on research-based teaching. This statement seems to be unsupported in 2021.

In 2008, the number of years of employment in teacher education is negatively related to the emphasis on research-based teaching, while the number of years of employment in schools is positively related. None of these variables is significantly related to the dependent variable in 2021. The interpretation of these results can only be speculative. The negative relation of the years in teacher education and the dependent variable in 2008 may have to do with the same mechanism as that of the negative relation of age, lack of adaptation to the new demands and expectations. The positive relation between years in school and the dependent variable may have to do with a selection effect. School teachers who later pursue an academic career may be particularly committed to research (see e.g. Smith, 2017). The fact that these employment variables are not significant in 2021 may indicate that research competence and time for research play a more important role in the latter than the former period. The higher explained variance ( $R^2$ ) of the model in 2021 than in 2008 may support such an interpretation.

### 3. Concluding remarks

Our results highly correspond with the factors highlighted as important in the research literature, and the changes from 2008 to 2021 support the notion that teacher educators become clearly more research oriented. Some of these changes can be related to the structural characteristics developed through the policy changes presented early in this article. One aspect involves the intake factors, such as requiring a PhD degree for employment; another pertains to resources for research, such as the time allocated. However, the analyses also highlight the more intangible factors, such as identity as a researcher. While resources and research competence may be improved by policy initiatives and local institutional priorities, teacher educators' identity may be harder to change and may actually provide a basis for resistance to change (Ben-Asher, 2019). Identity is also related to the question of what teacher education is and should be, the tension between a profession-oriented and research-based education (Afdal, 2017; Smith & Flores, 2019), and the relations between theory and practice, identified as a persistent problem in teacher education (Korthagen, 2010). To improve our understanding of the interplay between structural demands and subjective identity in the important research-teaching nexus, further studies that examine the interplay between policy and practice in teacher education are needed.

The study also has implications for the curriculum and teaching methods in Teacher education. As stated in the introduction, the aim is that teacher candidates should not just be research-informed consumers, but they should also be equipped to conduct their own research to investigate and explore interventions and educational practices (Menter & Flores, 2021). Newer Norwegian research has pointed out that there is a long way to go in creating a coherent teacher education program (Thorsen & Lundberg, 2022).

If we turn our head to the continuous professional development of teachers in schools, we find two distinct, different paths. One emphasizes the strengthening of formal teacher competence through participating in further specialization within subjects. The other emphasizes a whole-school development approach where teachers must play an active role in identifying what areas and questions to develop further, and then collaborating with teacher education staff in order to reach their stated goals. As stated earlier, the campus and schools are often considered two different cultures (Ulvik & Smith, 2019). To overcome this division, several collaboration and development projects have been initiated and funded. This may prove to be important for developing the connection between research within teacher education and work in schools, as well as developing schools themselves.

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