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Implementation of a National Teacher Education Strategy in Finland through Pilot Projects

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Abstract: The implementation of a teacher education strategy in a decentralised Finnish education system is analysed. Altogether, 31 pilot projects, involving teacher educators from all universities, were funded to support the implementation of the strategy and professional learning of autonomous teacher educators in the context of the strategy. In this mixed-methods research, the directors and active partners of the pilot projects were asked how they perceived the characteristics of the pilot projects that have been recognised as supportive for the implementation of the strategy. The directors were also asked to evaluate the impact of the projects. The projects have supported the achievement of the strategy's aims. Research and goal orientation, active learning, collaboration, contextualisation and reflection were emphasised in the pilot project activities. Common goal setting and evaluation of the pilot projects should be emphasised more in the implementation of the strategy.

Introduction

Planning and implementing a professional standard, a strategy, a development project or a reform programme in teacher education are common tools for improving teacher education and even the whole education system (Furlong, 2005; Panda, 2019; Young et al., 2007). However, it is challenging to engage teacher educators in implementing new ideas into practice. For example, Révai (2018) argues, based on the standards and strategy work in Estonia, Australia and Singapore, that it is challenging to coordinate the dialogue between the strategy work, the teacher education programmes and course descriptions and, moreover, to engage stakeholders in this dialogue. Strategies are too often developed by a small group of experts without enough planning for their implementation. For example, Beach et al. (2014, p. 167) recognised, based on their long-term policy analysis in Sweden, that Swedish reforms and development projects are too strongly led by governments alone. In general, new ideas developed at the ministry level have been recognised as challenging to implement from the ministry point of view or to adopt from the individual teacher educator point of view. Nonaka et al. (2006) analysed the adoption among

professionals from the organisational knowledge creation point of view. They argue that adoption builds on processes of learning and knowledge creation, which span individual, group and collective levels, where it is important to interact with peers and seek help from more expert colleagues. A similar idea is emphasised in communities of practice, where professionals collaborate and learn knowledge that has been developed in the community (Patton & Parker, 2017). Both views on adoption could be interpreted in the context of sociocultural learning theories, which consider adoption as a form of social learning that connects individual learning to the common practices and learning in groups and communities (e.g. Maier & Schmidt, 2015; Paavola & Hakkarainen, 2014).

To make progress in Finnish teacher education, the *Finnish Teacher Education Forum* (FTEF) was nominated by the Ministry of Education and Culture (MEC) in February 2016 and was asked to prepare a national teacher education strategy – the *Finnish Development Programme for Teachers' Pre- and In-service Education* (TEDP) (MEC, 2016). The MEC asked the forum to identify key competences and actions for improving teacher education and to support the implementation of the strategic aims in a decentralised education system through financing pilot projects and organising workshops and seminars.

The TEDP is similar to professional standards for teachers, teacher standards and teacher education standards from the point of view of communicating national aims for teacher education. They all emphasise the improvement of the quality of teacher education and teachers' professionalism (Panda, 2019). In the Finnish decentralised education system, teachers are educated at universities, which have high autonomy in the planning of the teacher education programs. There is no accreditation or state level evaluation of student teachers or teachers. Therefore, it is challenging to implement national level strategies to autonomous universities. We focus in this paper on the outcomes and characteristics of the pilot projects and how they guided teacher educators in local-level development work and professional learning related to the new strategic aims. The following research questions guides this research:

1. How the pilot project directors perceived
 - a) the achieving of aims and
 - b) characteristics of the pilot projects?
2. How the pilot project participants perceived the characteristics of the pilot projects?

The pilot project directors and participants were asked to evaluate the characteristics of the pilot projects by a survey. These pilot projects were aimed to be supportive for the implementation of a national teacher education strategy in Finland. Consequently, it was appropriate to look for the similarities and differences between the directors' and partners' perceptions of the pilot project. They both were active teacher educators working in various universities.

Before we answer the research question, we introduce the theoretical framework and briefly outline the context of the study. In the theoretical framework, we will analyse what is known about the implementation and adoption of teacher education strategies and the professional learning of teacher educators. Therefore, we consider adoption as teacher educators' professional learning process in the context of pilot projects in a way similar to Nonaka et al. (2006), who hold that adoption builds on processes of learning, and to Maier and Schmidt (2015), who consider adoption as a form of social learning, that connects individual learning to the emergence of common practices.

Theoretical Framework

National strategy for teacher education, here the TEDP, is not easily implemented or transferred to teacher education practices (Russel & Martin, 2010). Common approaches in the implementation of strategies include the use of control, such as an assessment of teacher performance or an accreditation aligned with the strategies (Call, 2018). However, little attention has been paid to teacher educators and how they adopt teacher education strategies through professional learning and practices, as Bourke et al. (2018) have argued. Several researchers, such as Kitchen and Figg (2011), have suggested that teacher education strategies are best implemented to practice through collaborative projects or activities or through communities of practice (Patton & Parker, 2017), which support teacher educators' professional learning. Révai (2018) claims that these types of collaboration situations help teacher educators to create a mutual dialogue amongst themselves and between stakeholders and schools and are seen as agents of change – that is, teacher educators create a shared language and a constant dialogue to understand what kind of competences teachers need. The Organisation for Economic Co-operation and Development (OECD) provides the following recommendations to achieve success in national-level strategy work and implementation of strategies (Burns & Köster, 2016):

- careful timing: allow enough time for planning and implementation;
- engage stakeholders, such as education providers, individuals at universities, teachers' unions and local authorities in the planning and implementation of the strategy;
- partner with teacher and employee unions;
- strive for consensus in the plan and implementation;
- serve sustainable resources for the implementation of the strategy;
- organise pilot projects and disseminate the outcomes of the pilots.

Characteristics similar to those of the OECD recommendations are described and discussed in various research papers. For example, Darling-Hammond (1999) emphasises the participation of teacher educators in the planning and implementation of teacher education policy aims. Pedaste et al. (2019) emphasise the planning of strategies in collaboration with representatives from the Professional Council of Education, teacher associations and teacher training universities as well as the Ministry of Education and Research, among many other stakeholders. Moreover, engaging schools and teachers in a partnership with teacher educators supports the development of teacher education because the school context should be taken into account while discussing the strategic aims (Williams, 2014).

We consider the implementation of a national strategy as a collaborative professional learning process of teacher educators that is supported by the state-funded pilot projects in a similar way as Maier and Schmidt (2015) and Paavola and Hakkarainen (2014) have argued. Consequently, the pilot projects connect individual learning to the common practices and collaborative learning in the context of strategic aims. In general, there is growing interest in the professional learning of teacher educators (Loughran, 2014; Murray & Male, 2005; Van Lankveld et al., 2017; Van Velzen et al., 2010). Teacher educators are professionals who have an intrinsic drive to learn, and they learn typically in formal and informal situations with colleagues and with student teachers (Ping et al., 2020). Czerniawski et al. (2018) surveyed teacher educators' opinions about their professional learning in Anglophone countries in Europe. Teacher educators valued most activities associated with research, personal reading, informal learning conversations with colleagues and opportunities to develop pedagogy. Ping et al. (2020) surveyed teacher educators' opinions about their professional learning in the Netherlands and

China. First, teacher educators prefer learning through academic engagement, such as through conducting academic and practitioner research. Traditional academic activities, such as reading and writing research papers or attending academic conferences are also considered supportive for professional learning. Second, they are willing to learn through formal and informal collaborative activities, such as in learning communities or through getting input from others by discussing or exchanging opinions. Third, they prefer participating in professional development programmes that support the development of teacher educators' expertise through planned and structured activities. Fourth, learning through reflective activities, such as collaborative and individual reflections on teaching, is recognised as supportive for professional learning. Similar to reflection is conducting an individual or collaborative self-study into teacher educators' practices. Contextuality in professional learning can also be supported through 'real-life' problem-solving situations (Renkla, 2001). Contextuality is important because observing the context-specific nature of professional knowledge is reported to be a prerequisite for professional learning (cf. Rasku-Puttonen et al., 2004).

The activities, which are supportive for professional learning and described, for example, by Ping et al. (2020) and Czerniawski et al. (2018) are contextual or linked to teacher educators' formal and informal activities. In the described activities, teacher educators collaborate with colleagues and are active in planning and working and, moreover, in reflection during and after the activities. Teacher educators are considered to be active in learning when they control or regulate their own learning by setting goals and reflecting on and self-assessing their own learning processes and products. Luft and Hewson (2014) argue that collaboration supports teacher educators to build, expand and challenge their notions about teaching and learning (Kitchen & Figg, 2011; Mansvelder-Longayroux et al., 2007). Collaboration during reflection helps in the sharing of beliefs and/or experiences and enables learning from experiences (Hiebert et al., 2002). Garet et al. (2001) emphasise that professional learning activities should be planned according to the core aims of the programme and be part of a coherent programme. Luft and Hewson (2014) argue that coherence is the way in which training offers focused learning opportunities related to the local context. The formal activities, such as participating in a research project or a professional development programme, are goal-oriented activities, where teacher educators are aiming to achieve a concrete goal.

The characteristics of activities supportive of teacher educators' professional learning are partly similar to the outcomes of research on school teachers' professional learning. This research emphasises the long-term nature of professional learning (Oliveira, 2010), teachers' active learning (Garet et al., 2001) and the connection of learning to the classrooms and practice context, collaboration and reflection (Van den Bergh et al., 2015). However, there are also characteristics of teacher educators' professional learning that come from the profession itself and from professional activities, such as the level of professional autonomy, the responsibility attached to the respective roles and teacher educators' accompanying expectations and differences in professional practices. For example, teacher educators are engaged in research activities and evidence-based practices in addition to teaching activities, and this research orientation should be taken into account when designing activities that support the professional learning of teacher educators (Cao, et al., 2021; Diery et al., 2020). Consequently, in the call for pilot project proposals, a research orientation and collaboration between teacher educators and schools were emphasised.

Context of the Study

Characteristics of Teacher Education in Finland

A key global goal of teacher education is to educate quality teachers through a quality programme (Scholes et al., 2017). The quality of education has been promoted through a decentralised approach since the 1990s. Following this decentralisation, only guideline-type strategic documents are prepared at the national level, such as framework curricula and teacher education strategies (Holappa, 2007). The Finnish orientation to teacher quality refers the factors operating at the school level and on the cultural and education policy levels - not only to the competence of individual teachers, as Müller et al. (2010) have emphasised.

Long-term planning and slow changes characterise Finnish education policy and practices. The education of primary teachers (grades 1–6) has been organised for 45 years and for secondary teachers (grades 7–12) for more than 100 years at the master's level. Teachers in vocational secondary-level education must have at least a bachelor's degree. Master's theses projects improve students' understanding of the relationship between theoretical knowledge and practice. The knowledge learned during the studies supports teachers' teaching and the planning and evaluation of teaching, students' learning and their learning outcomes. Broad planning includes all steps from the planning of the local curriculum to the planning of a single lesson (Niemi et al., 2012). Finnish teacher educators should have a PhD degree and allocate to research activities at least half of their yearly working hours (Eklund, 2018; Tirri, 2014).

Finnish Development Programme for Teachers' Pre- and In-service Education (TEDP)

The Finnish government (2016–2020) decided to prepare and implement a teacher education strategy, the TEDP, as a part of the education-related key actions of the government (MEC, 2016). The TEDP was designed by 70 experts from universities, the MEC and partner associations, such as the Finnish Agency for Education and representatives from the Association of Finnish Local and Regional Authorities, The Trade Union of Education, the Teacher Student Union in Finland and the Principals' Association, in order to support the collaborative planning and implementation of the strategy in a way similar to that undertaken in Estonia (Pedaste et al., 2019).

While designing the TEDP during one academic year, research outcomes related to teacher education were analysed, and national brainstorming related to the renewal of teacher education was organised. Moreover, several regional and four nationwide meetings were organised during the planning process (Lavonen et al., 2020).

The TEDP set out three strategic competence goals for teachers' pre- and in-service education and continuous lifelong professional learning. They are common to all types of teachers, from early childhood to upper secondary level. These competence goals describe what teachers should know and be able to do or engage in a similar way, as Torrance and Forde (2017) have described. According to the TEDP, Finnish teachers should

1. “have a professional knowledge base, such as deep knowledge in the subject matter and pedagogy; knowledge about learning, engagement and diversity among learners; collaboration and interaction as well as digital and research skills;
2. be able to generate novel ideas and educational innovations while, for example, constructing the local curriculum and planning inclusive education;

3. have the willingness and the competencies required for professional learning and the development of their schools' operations and environments". (Lavonen et al., 2020)

Furthermore, the TEDP introduced six strategic action guidelines which described key actions in the development of teacher education. The strategic action guidelines emphasise, for example, collaboration in the cumulative development of the competences of teachers. Training programmes and teaching/learning practices should be planned according to research outcomes, and student teachers should learn research skills (Lavonen et al., 2020).

The TEDP was planned to be implemented through research-oriented pilot projects, national seminars and workshops and local and regional meetings during the last three years of the government (MEC, 2016). Altogether, 45 collaborative and networking pilot projects were financed by the MEC through the allocation of 27 million euros during the period 2017–2020. The first open call for pilot project proposals was published at the end of 2016 and the second in 2017. The calls emphasised the aims and actions introduced in the TEDP. Moreover, the calls emphasised collaboration between pre- and in-service teacher education, collaboration with universities and schools and a research orientation in the projects. During the implementation process, the pilot project directors and the 70 expert group members came to national meetings four times a year during the three-year implementation process, where the pilot projects introduced their project processes through oral presentations and posters. Moreover, collected feedback data, similar to the data in this paper, were communicated to the project directors. Consequently, the quality assurance of the strategy process consists of the collaborative setting of strategic aims and peer evaluations of the pilot projects during the meetings.

All universities active in teacher education coordinated at least one pilot project. Two universities of applied sciences coordinated two projects. In each project, there was at least one partner university, and in one project all universities were partners. The pilot projects have been networking with the municipalities. Altogether, there were 129 of 456 possible municipalities that acted as partners.

Materials and Methods

This mixed-methods research is based on “triangulation design”, which is a one-phase design in which quantitative and qualitative methods are implemented during the same timeframe and with equal weight (Creswell et al., 2003). In order to answer the research questions, different data on the perceived outcomes and characteristics of the pilot projects were acquired from the directors and participants of the pilot projects by a likert scale instrument. The pilot project directors were also asked to share their perspectives on how the pilot projects achieved the aims of the projects. Moreover, the pilot project directors were asked to analyse working and professional learning in the project by answering to five open ended questions.

The questionnaires were designed in spring 2018 based on the call for pilot projects and the literature review related to teacher educators' professional learning. In the call, the aims of the TEDP and aims for the pilot projects were described. First, a Likert-type instrument (1 = the aim of the TEDP has not at all been achieved ... 4 = the aim has been achieved very well) asked the pilot project leaders to evaluate how well the aims of the TEDP, in the context of the pilot project, had been achieved. Altogether, 24 different aims were available for evaluation, but respondents were instructed to evaluate only those aims that were relevant to the pilot project. Both questionnaires were published in local languages. The translated questionnaires are in

Appendix 1 and 2. In a cover letter, the purpose of the research was explained and how the answers will be used for research purposes. The responders were also asked to accept if his/her answers could be used for research purposes.

The second set of questions asked the pilot project directors and the project participants to evaluate how the characteristics of the activities in the pilot project were supportive for the achievement of the TEDP aims with a Likert scale instrument (1 = not at all successful ... 4 = very successful in supporting the achievement of the TEDP aims). The items were designed based on the literature review on teacher educators' professional learning. Altogether, 11 different items were available for evaluation.

There were also five open questions in the questionnaire. These questions guided the project directors to analyse the project aims and how the project activities supported teacher educators' in achieving the TEDP aims or supported the professional learning of teacher educators. The project directors were asked to address the following aspects:

- the concrete aim of the pilot project and/or the expected outcomes;
- the working, communication and networking models in the pilot project, including digital communication supportive for achieving the TEDP aims;
- how teacher educators were supported to network a) inside the project and b) with other teacher educators and schools;
- how a) research-based approaches and b) international collaboration were used in the pilot project and supported the achievement of the TEDP aims; and
- how the progress of the pilot programme was a) evaluated and b) reflected.

The process of designing, refining and piloting the questionnaire items was iterative, and the role of the executive board (consisting of 10 experts) was essential. Board members were aware of the aims of the TEDP and the research on teacher educators' professional learning. A shorter questionnaire for pilot project partners was prepared based on the main questionnaire. All pilot project leaders and at least five active partners in the pilot project completed the questionnaires.

The medians were almost the same for the pilot project leaders and partners for each item. Therefore, means and standard deviations were calculated to compare the responses of the pilot project leaders and partners, although the skewness and kurtosis of the distributions were relatively high (skewness -1.3 to 1.2; kurtosis -1.4 to 1.6), Statistical significance was analysed with the Mann-Whitney U-test, because the scales were interpreted as ordinal.

The data were collected in summer 2018. Therefore, the data collection occurred 1.5 years after the publishing of the TEDP and start of the pilot projects. Altogether there were 125 standard pages, or 36 267 words, in the data related to the open answers. The open answers were analysed as one block, following traditional theory-driven content analysis procedures, to describe the nature of activities supportive for achieving the TEDP aims. The basic assumption of the deductive or theory-driven content analysis method is that units classified in the same categories are recognised by the researchers as sharing the same meaning (Elo & Kyngäs, 2008). The main categories used in the analysis or coding are based on the research on teacher educators' professional learning. According to the literature review, teacher educators' learning or implementation of the new teacher education strategy to teacher education practices could be supported by guiding teacher educators in a goal-oriented, active and collaborative learning process. Moreover, the teacher educators should be guided in evaluating and reflecting on their working and learning. The real teacher education context and the research orientation in the project could help to support the learning. The idea of collaboration involves networking at the

local and national levels. The main categories and their definitions in the coding are described in Table 1.

Main category	Description of the category
Goal orientation	The pilot project activities are designed or organised according to the pilot project aims, which are in line with the aims of the national TEDP.
Active learning	Teacher educators are active in setting the aims or planning the activities of the pilot project and working actively on the pilot project activities.
Collaboration	Teacher educators who are participating in the pilot project are active in collaboration, interaction or networking with other teacher educators. They could also network with teacher educators who are not in the pilot project in their own or other teacher education institute or with school teachers.
Reflection	Teacher educators who are participating in the pilot project are evaluating project activities or reflecting on the process or outcome of the pilot project or their own learning.
Contextualising	Teacher educators who are participating in the pilot project are developing, improving or designing something they can use in their own teaching or supervision, or they are developing a teacher education programme or curriculum. The outcomes of the project are applied directly to teacher education.
Research orientation	The design of the pilot project is based on research activities, or the needs are clarified based on research.

Table 1. The main categories describing the nature of the activities of the pilot projects and their definitions used in coding the answers of the pilot project leaders.

After defining and describing the main categories, a pilot coding process was organised to clarify the categories and their definitions. A coding unit, including one core idea, was assigned for each main category. During the pilot testing, the first author analysed three pages of the text, and a research assistant examined the same amount of text. After the pilot testing, they discussed the findings and agreed to add examples, especially to the ‘collaboration’ and ‘contextualisation’ category descriptions (see Table 3), in order to better recognise the categories in the text. Altogether, 2097 coding units were identified in the responses. In the text, there were several sentences that did not focus on the domain of professional learning, such as ‘*We used Facebook and web pages for informing forthcoming activities.*’

The coding units in each main category were then coded into subcategories. These subcategories were constructed inductively based on the project leaders’ answers. The analysis followed handbook guidelines (e.g. Schwarz, 2015; Weber, 1990). During the inductive coding, a total of 20 subcategories were recognised under the main categories. The definitions and coding were tested in a way similar to the coding of the main categories. In a second test, 76% of the units on pages 4–6 were coded in a similar way by the research assistant and one of the researchers. Table 3 introduces the definitions and examples for each subcategory and the frequencies of all subcategories.

Results

Our aim has been to analyse the outcomes and the characteristics of the pilot projects that supported the implementation of the TEDP. The implementation was considered to take place through teacher educators' professional learning. The pilot project directors were asked to evaluate how well the pilot project supported the achievement of the original aims of the TEDP. The directors believed that 20 out of the 24 listed strategic aims had been achieved well (the average was over 2.5 in four-point scale). According to the evaluations, the research-oriented pilot projects have had good progress, for example, in the development of the following:

- practices that support the development of competences needed in the teaching profession;
- practices that support the development of student teachers' research skills;
- practices that support student teachers' in the generation of ideas;
- the selection of students for teacher education programmes;
- collaboration culture in teacher education;
- networking in teacher education;
- student centredness in teacher education;
- learning environments in teacher education.

The directors, especially (average over 3), emphasised that the pilot project activities had been research- and goal-oriented and interactive, as was emphasised in the call for proposals. Only four aims were evaluated to have been achieved satisfactorily, meaning their average was between 2 and 2.5. These aims were related to the structure of the teacher education, the description of the teacher education programme, the use of digital tools in teacher education and pedagogical leadership. Because the pilot project directors evaluated that almost all of the aims of the TEDP had been achieved at least well, it is appropriate to analyse the pilot project activities because they have supported the teacher educators in achieving the aims of the TEDP or supported the teacher educators' learning according to the aims of the TEDP.

To have two views on the characteristics of the pilot project activities, how the pilot project directors ($N_{\text{Director}} = 31$) and partners ($N_{\text{Partner}} = 500 - 670$ depending the question) had experienced the characteristics of the pilot project activities supportive for the achievement of the TEDP aims. The evaluations are presented in the Table 2.

Characteristics of the pilot project activities which were supportive for the achievement of the TEDP aims	Partner			Director			<i>U</i>	<i>p</i>
	<i>N</i>	<i>M</i>	<i>S.D.</i>	<i>N</i>	<i>M</i>	<i>S.D.</i>		
There has been interaction among the project members	697	3.52	.73	31	3.72	.46	9973	.231
We have been working collaboratively	694	3.46	.75	31	3.72	.46	9336	.081
The previous knowledge and skills of the partners have been taken into account	684	3.35	.83	30	3.33	.71	9709	.581
Our work has been research based	670	3.29	.87	31	3.78	.42	7335	.001
We have been working in authentic situations during the pilot project	643	3.17	.94	29	3.17	.89	9178	.879
Partners have been active in the pilot project	669	3.08	.95	31	3.31	.73	9541	.269
Partners have been networking in their own institutes	608	2.96	1.07	31	3.23	.72	8553	.360
Partners have been guided to reflect on their learning during the pilot project	587	2.95	.98	29	3.21	.68	7563	.286
Partners have been networking with experts outside their own institutes	654	2.86	1.03	28	2.92	.71	9112	.964
Partners have been active in evaluating the progress of the pilot project	521	2.36	1.18	31	3.03	0.82	5707	.002
Partners have been active in setting aims for the pilot project	520	2.23	1.28	31	3.19	0.79	4648	0.00

Table 2. Evaluation of the characteristics of the pilot project activities by the partners and the directors of the project,

For a third view considering the characteristics of the activities of the pilot projects supportive for implementation, we analysed the project directors' ($N_{\text{Director}} = 31$) answers to the five open questions, as described earlier, using the main categories introduced in Table 1. The identified subcategories in the inductive coding and their frequencies are presented in Table 3.

Main category	Subcategory	Description of the category the text emphasises	f	Example of a text
Goal orientation	- setting of pilot project aims	- the aims of the pilot projects are discussed or set in collaboration	84	<i>We will design new content for special needs education through a network of six universities and several schools.</i>
	- progress according to original aims	- progress of the project according to the aims	53	<i>Systematic coordination has supported the sub-projects' progress according to the aims.</i>
	- progress according to new aims	- progress of the project according to the modified aims or delay in the progress	19	<i>In the original aims, we did not emphasise international collaboration as much as it now realised. Therefore, we modified the original aims.</i>
Activeworking and learning	- active co-planning	- TEs active in the planning of the activities	73	<i>The frequent meetings of the planning group are important for making progress in the project.</i>
	- active learning	- TEs active in learning in the pilot project activities, such as workshops, weekly meetings and seminars	93	<i>We organised a two-day boat seminar to engage TEs in the design of the project outcome. We made a site visit in order to benchmark practices. We designed learner-centred MOOC.</i>
	- conference participation	- TEs actively participating conferences and seminars	40	<i>We encourage TEs to participate in conferences in order to present the project outcomes and for international networking.</i>
Collaboration	- international collaboration	- TEs active in international collaboration within the pilot project	53	<i>We have utilised our international research network to discuss the outcomes about equality in TE.</i>
	- national collaboration	- TEs active in national collaboration within the pilot project	90	<i>We are networking actively with TEs in other universities and have received more external money for organising network meetings.</i>
	- local collaboration	- TEs active in local/own unit collaboration within the pilot project	40	<i>TEs have been supported to collaborate and network locally, including networking with schools, mentor Ts.</i>
	- collaboration through digital tools	- TEs active in collaboration through digital tools within the pilot project	53	<i>We have used Facebook for dissemination of the project outcomes – there is active interaction and commenting from other Nordic countries.</i>
Reflection	- self-evaluation	- TEs active in self-evaluation	12	<i>We have been active with TEs in the development of a questionnaire which supports TEs self-evaluation.</i>
	- reflection	- TEs active in reflection	8	<i>A special meeting supporting TEs' reflection has been organised.</i>
	- reflection based on data	- reflection based on the collected feedback or data from the TEs	32	<i>The course evaluations, collected during spring 2018, show that the training has been useful for the participants.</i>
	- quality work	- design and reflection is part of the quality work	2	<i>We have developed, tested and validated a questionnaire which could be used in the evaluation of TEs' PL.</i>

Main category	Subcategory	Description of the category the text emphasises	<i>f</i>	Example of a text
Contextualising	- designing an outcome	- TEs active in developing, improving or designing something they can use in their own teaching or supervision	165	<i>TEs have designed new pedagogical models for organising teaching practice, especially towards collaborative and innovative learning. We are designing a local model to support teachers' professional development and will implement the model in all schools in the local area.</i>
	- designing learning material	- TEs active in developing learning materials	35	<i>We have developed podcasts and YouTube videos which introduce pedagogical approaches, such as co-teaching and pedagogical leadership, and support the learning of transversal competences by student teachers.</i>
	- designing the programme	- TEs active in developing the teacher education programme or curriculum	31	<i>We have been active in improving secondary teacher education programmes and teaching methods supporting innovative orientation in teacher education in versatile learning environments.</i>
Research orientation	- clarifying of needs	- the needs are clarified or recognised based on research	48	<i>We conducted a systematic review of health education teachers' competencies and teacher education and interviewed 85 health education teachers and student teachers in order to identify needs. We designed the in-service model and considered the research on TEs' learning.</i>
	- design is based on research	- the design of the pilot project outcome is based on research activities	128	<i>The designed teacher education models have been piloted, and we will continue the research-based development.</i>
	- international research collaboration	- international research collaboration	19	<i>The model supporting the induction phase has been developed in research collaboration with Nordic and Baltic researchers.</i>

Table 3. The subcategories and definitions used in the inductive coding of the answers of the pilot project leaders ($N_{\text{Director}} = 31$) and examples of original answers (TE = teacher educators).

Discussion

Implementing a professional strategy in teacher education and engaging teacher educators in the implementation of the strategy to teacher education programmes and activities is challenging, as Beach et al. (2014, p. 167) and Révai (2018) have argued.

The directors of the pilot project indicated that 20 out of the 24 listed strategic aims of the TEDP had been achieved well or very well through the pilot project activities. The aims related to the nature of the development work, such as ‘*The project leader emphasises interaction in his/her leadership*’ or ‘*The project activities are research based,*’ were evaluated as having been

achieved very well. The aims related to the six strategic action guidelines were determined to have all been achieved very well or well. There were, however, challenges in the implementation of the pilot project outcomes within teacher education courses. Three aims related to these type of aims were considered to have been achieved only satisfactorily. However, the survey was organised after 1.5 years after starting the pilot project activities, and the concrete implementation was at the beginning.

We have been especially interested in this paper about the characteristics of the pilot project activities and how they supported the implementation of the TEDP and guided the teacher educators in their professional learning related to the new strategic aims. We assume that the implementation of the strategy happens through professional learning and practices, as Bourke et al. (2018) Nonaka et al. (2006) and Maier and Schmidt (2015) have argued. In a similar way, Révai (2018) argued that professional learning and activities help to create a mutual dialogue between teacher educators and stakeholders and could be seen as agents of change. Moreover, the pilot project directors evaluated that the projects have achieved aims, which were emphasised in the TEDP. These are the reason why we have analysed the characteristics of the pilot projects. The characteristics of the pilot project activities were analysed based on the pilot project directors' and active partners' responses to the surveys, which monitored their experiences in the pilot project activities. And, as mentioned, to have a third view considering the nature of the activities, we analysed the pilot project directors' answers to the five open questions.

The directors and partners felt strongly that eight of the 11 characteristics had been very supportive for the implementation of the TEDP aims (the average was over 2.9 on a scale of 1–4; Table 2). The partners' prior knowledge was taken into account, and the work was organised in authentic situations (contextuality), as Rasku-Puttonen et al. (2004) and Renkla (2001) have emphasised. Moreover, the partners were guided to interact, collaborate and reflect on their own learning. This means that the work was consistent with the recommendations of the research on teacher educators' professional learning (Czerniawski et al., 2018; Ping et al., 2020). Moreover, both the directors and the partners felt that the partners had been active in the pilot project activities and had networked with other experts in their own institutes as well as experts from outside of them.

The directors' and partners' evaluations of the characteristics of the pilot project activities were rather similar, but there were statistically significant differences in the evaluations in three cases (Table 2). First, the directors found the work to be more research-based than the partners did. However, the partners' average related to research orientation item was also high, 3.3, in four-point scale. Consequently, both directors and partners felt that there had been a strong research orientation in the projects. This is important as teacher educators are typically engaged in research activities in addition to teaching activities (Cao et al., 2021; Diery et al., 2020). Second, the directors perceived higher than partners that the partners were active in the setting of aims and, third, in the evaluation of the progress of the pilot projects.

Both recognised the pilot project activities as having taken place in real situations or within contextual topics in their evaluations of their activities (Table 2). This information could be connected to the very positive evaluations of the directors of the pilot projects related to the achieving of the aims of the pilot projects. For example, the directors evaluated that the partners had learned practices to support the development of student teachers' competences they need in the teaching profession or how to engage student teachers in learning as well as how to support students' learning. We claim that the pilot project approach in the implementation of the TEDP

have had potential to support the learning of the teacher educators and to implement new materials and practices in real teacher education situations, as Rasku-Puttonen et al. (2004) and Renkla (2001) have emphasised. Consequently, most characteristics that have been recognised in the research literature as supporting teacher educators' professional learning were evaluated to have been experienced well in the pilot project activities (the average was between 2.9 and 3.8) (Czerniawski et al., 2018; Kitchen & Figg, 2011; Mansvelder-Longayroux et al., 2007; Van den Bergh et al., 2015).

Only two characteristics supportive of professional learning were evaluated to have happened at least satisfactorily, especially by the partners (average 2.2 to 2.4). The partners felt that they did not have adequate opportunities to participate in establishing the aims of the pilot project or in the evaluation of the progress of the project. Therefore, it is important in future projects to ensure more possibilities for partners to participate in the goal setting and evaluation of the progress of the project.

As shown in Table 3, the pilot project leaders' answers to the open questions most frequently included mentions of collaboration (336 times) at the national (90), international (53) and local levels (40) as characteristics of working and learning within the pilot project, especially collaboration through the use of digital tools (153). Social media, learning management systems and collaborative digital media (61) were mentioned more frequently than traditional email (11). This is in line with the survey: Both the directors and partners strongly felt (the average was over 3; Table 2) that the activities in the pilot project had been very interactive and collaborative. The directors mentioned the contextualisation of the work (231 times) by designing a concrete model of teacher education (165), designing learning materials (35) or renewing the teacher education programme (31). This contextualisation was also recognised as an important characteristic of the pilot project by the pilot project partners (Table 2: *We have been working in authentic situations during the pilot project*). Active learning (93), co-planning of the activities (73) and active participation in activities (40) were also highly emphasised in the answers. The project partners recognised these as important characteristics of the pilot project in answering the survey. Research orientation in designing (128), clarifying needs (48) and international research collaboration (19) were also emphasised in the open question answers. The pilot project leaders wrote about aims, the setting of aims or the re-setting of aims 156 times in their open answers, but the project partners felt that they had not been participants in the setting of aims. According to Table 2, the partners indicated that they had not been so active in self-evaluation related to the pilot project. This is in line the low number of mentions of self-evaluation – the leaders wrote about the role of self-evaluation in the pilot projects 12 times in their open answers. However, in the survey, both directors and partners emphasised that they had been successfully supported in reflection on their own learning. The directors wrote about reflection 40 times, which is rather low compared to the other characteristics (Table 3). In the big picture, the findings are similar to those of Czerniawski et al. (2018) and Ping et al. (2020), who surveyed teacher educators' opinions about their professional learning. Ping et al. (2020) recognised learning through formal and informal collaborative activities, such as in learning communities or through getting input from others by discussing or exchanging opinions. They also emphasised reflective activities, such as collaborative and individual reflections.

The project directors evaluated the research orientation (*Our working has been research based*) in the pilot projects as one of the most successful characteristics from the point of view of success in the implementation and learning; however, the partners situated this characteristic in the middle of the list of successful characteristics. Research orientation in professional learning

was also recognised as most important for teacher educators by Czerniawski et al. (2018). Ping et al. (2020) argue that teacher educators prefer learning through academic engagement, such as conducting academic and practitioner research or a development project. Traditional academic activities, such as reading and writing research papers or attending academic conferences, were also considered supportive for professional learning (Cao, et al., 2021; Diery et al., 2020).

We argue based on the survey data and analysis of the open answers that the implementation of the TEPD through the pilot projects offers a supportive environment for teacher educators' autonomous roles in their project activities and professional learning. Collaboration and networking creates forums for discussing the strategic aims and their implementation and supports the planning and implementation of the TEDP (Kitchen & Figg, 2011; Paavola & Hakkarainen, 2014). Therefore, collaboration and networking include teacher educators' collaboration inside one university, between universities and between stakeholders and parties in education, such as the MEC, providers of education or municipalities and teachers. These 'supportive' characteristics for the implementation of the strategy also support teacher educators' professional learning (Maier & Schmidt, 2015). This is important for implementation because the implementation was assumed to happen through teacher educators' professional learning within the pilot projects. However, there is clear evidence that the project partners felt they did not have enough possibilities to participate in the setting of aims for the pilot projects and in the evaluation of progress of the pilot projects – although the project directors felt that they had. Therefore, common goal setting and evaluation should be emphasised more in teacher educators' professional learning.

There are limitations in the Finnish approach to the implementation of a national strategy in teacher education. The limitations are consequences of the decentralised education system and the autonomous role of teacher educators. The autonomous role of teacher educators refers to different individuals having attended different meetings according to their personal interest. This makes it difficult to achieve consensus even through collaboration. On the other hand, a consensus orientation means that strategic objectives have not necessarily been structured into the most coherent structure. Moreover, it is challenging to construct a clear plan or agreement on the responsibilities, schedule and support of the implementation process. Therefore, developing a national-level strategy for teacher education through collaboration is not an easy process.

There are also limitations in our study. First, the data collection was done 1.5 years after the starting of the pilot projects, and the implementation process was not ready. However, in policy-driven activities, it is important to plan and implement the strategy during one government period. The monitoring and evaluation should be included in the process. Second, the main informants were the 31 pilot project directors. However, they have also been teacher educators – not only pilot project directors. In order to learn more about the implementation of the strategy, a larger group of teacher educators and even student teachers should be interviewed and teacher education practices observed. Third, it is challenging to determine the influence of collaborative strategy planning in the implementation of the strategy. Therefore, this link should be researched further.

Conclusions

We have been researching the implementation of a teacher education strategy, TEDP. The TEDP was implemented through teacher education practices-oriented pilot projects, because it is

widely known that strategies are not easily transferred to practice (Révai, 2018; Russel & Martin, 2010). A common approach in the implementation of strategies or standards is control, such as a national-level assessment of teachers' performance or accreditation aligned with the standards (Call, 2018). Bourke et al. (2018) have argued that little attention has been paid to teacher educators and how they adopt teacher education strategies through professional learning (Maier & Schmidt, 2015; Nonaka et al., 2006). Although, we are not able to generalise our findings, we think that teacher educators should be better taken into account in implementing strategies or policy to practice.

Instead of the control approach, it has been appropriate to implement the TEDP through supporting teacher educators' professional learning, especially in a country which emphasises decentralisation and autonomy at the teacher, school, and municipality and university levels. Decentralisation allows teacher educators to address local contexts, such as collaboration with local providers of education, stakeholders and student teachers as well as education research outcomes in the implementation. However, decentralisation and autonomy make the implementation of national strategies challenging – that is, how autonomous entities could and should be supported in adopting strategies. In this type of environment, the collaborative construction of a national-level teacher education strategy, TEDP, and the implementation of the strategy through national and local meetings and especially through funded pilot projects have been recognised as supportive for the implementation of the strategy and teacher educators' professional learning process.

Our study does not tell much about the learning outcome of teacher educators and how the teacher education programmes have changed. We have only project directors self-assessment about achievement of the aims of the TEDP. Research on teacher education programmers and practices are needed in order to know in detail about the outcomes of the implementation of the strategy. However, this study tells about the learning process of teacher educators. The call for and subsequent organisation of pilot projects have been supportive for the teacher educators professional learning processes. The process had similar characteristics to what is known as supportive to teacher educators professional learning based on the literature review. It is important to know how in a country, where education system is very decentralised, it is possible to engage teacher educators in professional learning in the context of new teacher education strategy.

During the construction of a national-level teacher education strategy, we recognised that the preparation of a teacher education strategy needs enough time and large group of experts in order to achieve a consensus in the design. In our case the preparation of the strategy was done in a 70-person expert group, where we had representatives from all universities. Moreover, we engage stakeholders, such as, education providers, employee organisations and teacher unions, in addition to ministry people and teacher educators in the planning process (Lavonen et al., 2020). Based on our experiences on the implementation of the strategy, we suggest that it is important to consider the following:

- Engage stakeholders, such as education providers, in the implementation of the teacher education strategy or teacher standard.
- Provide sustainable resources for the implementation of the strategy and publish an open call for pilot projects. In our case, altogether 45 collaborative pilot projects were financed by the MEC through the allocation of 27 million euros during the period 2017–2019.
- Organise research-oriented pilot projects that support the professional learning of teacher educators and the dissemination of the strategy and pilot project outcomes. Research-

oriented pilot projects support teacher educators' professional learning, but so does the networking inside and between the universities and between the universities and schools. The pilot projects emphasised goal orientation, active working and learning, collaboration, reflection, the contextualising of the learning and a research orientation as described in detail in the Table 3.

- In the call for pilot projects, emphasise large proposals, which are designed through collaboration between universities and education providers (schools). In our case, all universities and one-fourth of the municipalities (providers of education) acted as partners in the pilot projects.

Consequently, the implementation of the strategy, TEDP, has been in line with OECD recommendations (Burns & Köster, 2016) or those in research papers (Darling-Hammond, 1999; Pedaste et al., 2019; Williams, 2014). The original OECD recommendations (Burns & Köster, 2016) did not include a research orientation in the planning and implementation of national-level strategies. They also did not include continuous quality assurance, which refers to, for example, the collection of progress data from the pilot projects and informing the pilot projects based on the collected and analysed data. In our case, the quality assurance happened mainly through collaboration, networking and national meetings, which offered opportunities for presentations of the pilot projects and peer-evaluations. Piloting also allows the modification of the aims if needed. In general, piloting provides an environment for teacher educators' collaborative and reflective professional learning and serves as a tool for disseminating the strategy (Kitchen & Figg, 2011; Maier & Schmidt, 2015).

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Appendix 1

Project Director Questionnaire

1. What were the concrete aim of the pilot project and/or the expected outcomes?
2. Describe working, communication and networking models in the pilot project, including digital communication, supportive for achieving the TEDP aims.
3. Evaluate how well the aims of the pilot project had been achieved with a likert scale instrument (1 = the aim has not been achieved at all; 4 = the aim has been achieved very well)

The leadership in the project emphasises interaction.

The leadership in the project is goal oriented.

The leadership in the project supports project partners to achieve the aims of the project.

The project activities are research based.

The project activities have been designed according to the analysis of partner needs.

The project activities support the collaboration with different parties in teacher education.

We ave developed practices that support the the selection of student for teacher education programmes.

We have developed collaboration culture in teacher education.

We have developed internationalisation in teacher education.

We have developed learning environments in teacher education.

We have developed networking in teacher education.

We have developed practices that are supportive for the development of school and teachers' development plans.

We have developed practices that support student teachers' in the generation of ideas.

We have developed practices that support the development of student teachers' research skills.

We have developed practices that support the development of student teachers' competences they need in the teaching practice.

We have developed practices that support the development of student teachers' engagement in learning.

We have developed practices that support the development of the collaboration between different parties in teacher education.

We have developed practices that support to clarify the needs of new teachers.

We have developed student centredness in teacher education.

We have developed the use of digital tools in teacher education.

We have developed practices that support the development of pedagogical leadership at school.

We have had progress in the renewal of pedagogical studies.

We have had progress in the renewal of teacher education programmes.

We have had progress in the renewal of the structure of teacher education.

4. Evaluate the nature of pilot project activities, which were supportive for the achievement of the project aims, with a likert scale instrument (1 = not at all successful ... 4 = very successful)

Our work has been research based
Partners have been active in evaluating the progress of the pilot project
Partners have been active in setting aims for the pilot project
Partners have been active in the pilot project
Partners have been guided to reflect on their learning during the pilot project
Partners have been networking in their own institutes
Partners have been networking with experts outside their own institutes
The previous knowledge and skills of the partners have been taken into account
There has been interaction among the project members
We have been working collaboratively
We have been working in authentic situations during the pilot project

5. How teacher educators were supported to network a) inside the project and b) with other teacher educators and schools?
6. How a) research-based approaches and b) international collaboration were used in the pilot project and supported the achievement of the TEDP aims?
7. How the progress of the pilot programme was a) evaluated and b) reflected?

Appendix 2

Project Partner Questionnaire

1. Evaluate the nature of pilot project activities, which were supportive for the achievement of the project aims, with a likert scale instrument (1 = not at all successful ... 4 = very successful)

Our work has been research based
I have been active in evaluating the progress of the pilot project
I have been active in setting aims for the pilot project
I have been active in the pilot project
I have been guided to reflect on their learning during the pilot project
I have been networking in their own institutes
I have been networking with experts outside their own institutes
My previous knowledge and skills have been taken into account
There has been interaction among the project members
We have been working collaboratively
We have been working in authentic situations during the pilot project