CHAPTER 2

Research-Based Teacher Education

A Finnish Perspective

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Abstract

Our focus in this article is to reflect on the value research-based teacher education adds now and will add in the future. First, we review the literature to investigate the nature of research-based teacher education, asking what it is and how it is envisioned and practiced. Second, we explore how research-based teacher education is evident in the Finnish teacher education system and present an example of an educational science learning environment, namely the research workshop.

Research-based teacher education seems to foster reflectiveness in practitioners and academic experts. However, a post-truth world presents challenges when it comes to supporting teachers' professional knowledge. One key challenge is how to promote learning and professional development as a continuous process for teachers, from study and qualification to the in-service phase. The idea of a continuum – and of dialogue – is central to the evolution of teacher education going forwards. We argue that research-based teacher education helps teachers to become epistemically responsible and skilful professionals.

Keywords

research-based teacher education – research workshop – reflectiveness – professional development – dialogue – epistemic responsibility

1 Introduction

In the current knowledge environment, teachers' work is undergoing a remarkable change. Children are living in a world of post-truth, where arguments are based on emotions rather than facts (Brew & Mantai, 2017; Hauke, 2019), and personal beliefs have a tendency to trump expertise and academic values

(Hughes, 2019). Thus, although teachers' work is practical in nature, nowadays it deals increasingly with knowledge and information. Prospective teachers must thus be educated to become epistemically skilful and responsible professionals. Research-based teacher education provides a strong basis for this.

In their work, teachers simultaneously draw upon multiple knowledge sources to support their practical activity (Toom & Husu, 2018). They need subject knowledge, for instance, along with knowledge of teaching techniques and pedagogical content knowledge (as defined by Shulman, 1987) and the skills to be able to reflect on the rationale for their own action (see Mikkilä-Erdmann & Iiskala, 2020a; Pintrich, 2002). Thus, teachers must combine and develop knowledge in creative ways. Student teachers can be supported to work with scientific concepts and tools to enable them to support children's learning in schools and develop their communities (Edwards, 2017). In order to deal with the unpredictable nature of life in schools, teachers cannot base their responses to problems of practice solely on prior knowledge; they must also be able to recognise epistemic dilemmas and respond agentically to them so as to introduce fresh knowledge (Hopwood, 2017). Therefore, teachers cannot be mere knowledge carriers; they need to be productive participants in the information society (Damşa et al., 2010).

However, the role of teachers differs between countries, affecting the opportunities presented to student teachers to become epistemically skilful, that is, to become aware of different knowledge bases and how knowledge is constructed and used. This also encompasses ethical awareness and responsible action with regard to knowledge. In Finland, the autonomy of teachers is guaranteed by law, as there are no standardised tests or school inspections (Mikkilä-Erdmann et al., 2021; Simola et al., 2017). Teachers' status in Finland is relatively high. Teachers are not expected to merely train children in specific skills but provide them with a more holistic education. Accountability policy in Finland is radically different from that in many other countries and initiatives are implemented by consensus, collaboration and shared development (Toom & Husu, 2021). Thus, in Finland, it is important for teachers to learn how knowledge is used, produced and reproduced in society, so that they are able to teach their pupils these skills. Because the main objective of research is critical and productive engagement with knowledge (Barnett, 2005), it is necessary for the teacher education system to engage with research in research-based teacher education.

Efforts to improve the teacher education research base have been made in countries across the world (Afdal & Damşa, 2018; Afdal & Spernes, 2018; Darling-Hammond et al., 2017). The Netherlands, Canada, Singapore and others are currently reforming their research-based teacher education systems (Baan et al., 2019). The rationale for these reforms is prior studies indicating

that research-based teacher education programmes seem to be more effective than traditional ones (Tatto, 2015). Early-stage primary teacher education programmes in Finland have followed this approach and have been identified as research-based (Darling-Hammond et al., 2017). The general starting point has been that the research base improves the quality of teacher education and, in the best cases, also has an effect on students' learning outcomes. Research-based teacher education in Finland has therefore assured a certain level of quality – when good student performance and student success has been documented by international comparative studies such as PISA, this has often been due to research-based teacher education (see Toom et al., 2010).

However, traditions and contexts differ from country to country, as do the goals and practices of research-based teacher education. In Finland, the introduction of research-based teacher education dates back to the 1970s, when basic education was reformed and the 9-year comprehensive school system was created (Tirri, 2014). The new type of school brought changes in the teaching profession, and as a consequence, primary school teachers began to study at multidisciplinary universities. In Finland, the primary teacher profession is also high-status, and primary teacher education is one of the most attractive university programmes (Mikkilä-Erdmann et al., 2019): 5 years culminating in a master's degree. Graduates are accorded general teaching qualifications and are permitted to teach grades 1–6 (ages 7–13 years). All programmes across the eight Finnish universities providing teacher education are in principle research-based. However, programmes vary in terms of curriculum and the details of delivery, for example, objectives and content relating to research skills, and methods of study. This paper presents one model for studying research skills: the 'research workshop', which was developed and is deployed at the Department of Teacher Education at the University of Turku.

Our focus in this article is to reflect on the added value provided by research-based teacher education now and in the future. First, we undertake a literature review to investigate the nature of research-based teacher education, asking what it is and how it is envisioned and practiced. Second, we explore how research-based teacher education is evident in the Finnish teacher education and present an example of an educational science learning environment, namely the research workshop.

2 What Does 'Research-Based' Mean?

A number of concepts have been used to explain what makes teacher education programmes research-based. Research-based teacher education can refer to the qualifications of teacher educators, their participation in research

projects, and the goals of teacher education programme leaders (Munthe & Rogne, 2015). At the level of teaching, research-based teacher education can focus on the one hand on the content of research and research problems and processes, or on the other hand on teacher- and student-focused practices (Healey, 2005). Tatto and Furlong (2015) set out four ways in which teacher education could be research-based. First, the content can be informed by research-based knowledge. Second, the design and structure of teacher education can be informed by research. Third, teachers and teacher educators can be equipped to engage with and become consumers of research. Fourth, teachers and teacher educators can be educated to do their own research.

Alongside research-based teacher education are other similar concepts that point in the same direction. Overall, it has been noted that 'research' as such can be used as a conduit to support the learning of future teachers, enabling them to incorporate enquiry-based approaches into their teaching (Tatto, 2015). Student teachers' development of research skills is of particular interest because such skills are concerned with how knowledge is produced in universities, and maintained and reproduced in society (Murtonen & Salmento, 2019) and cultivate the concepts, tools, and embodied skills needed to apply those insights (Heikkilä et al., 2020). They foster epistemic maturity and provide the opportunity to realise that knowledge is created by human beings and as such always uncertain (Murtonen & Salmento, 2019). Research skills have been claimed to help with the completion of teaching degrees (Toom et al., 2010), promote professional development, facilitate observation and analysis of pupils' backgrounds, encourage engagement with research-based professional literature, and help raise awareness of the links between school and society (Heikkilä et al., 2020).

Although Finnish teacher education commonly defines research as a skill, this is not generally the case in international literature (Heikkilä et al., 2020; Mikkilä-Erdmann et al., 2019; Niemi & Nevgi, 2014; Stenberg et al., 2016). Instead, researchers use analogous terms such as 'enquiry orientation' (Tatto, 2015) or 'research-based thinking' (Toom et al., 2010). Lately, the term 'research literacy' has been used to describe the aims of research-based teacher education. Boyd (2021) defines teachers' research literacy as demonstrating a reasonable understanding of the contested nature of 'ways of knowing' (epistemology) within the field of education. Research literacy includes an appreciation of the purposes and values of research, the interplay between research and practical wisdom in deciding what and how to teach, and critical evaluation skills to differentiate different sources of evidence. In other words, teachers need critical enquiry skills. Boyd further argues that teachers require research literacy to inform the reasoned judgements they need to make in their day-to-day professional practice and to inform their professional contribution to school

leadership and development of educational practice and policy (Boyd, 2021). The notion of research literacy thus highlights the necessity of epistemically proactive teachers who not only react as necessary to situations but have a researcher-like attitude towards their work and to the development of their school and of educational policy in general.

Different dimensions of research-based teacher education have been outlined (see Table 2.1, based on Mikkilä-Erdmann & Iiskala, 2020b). Research-based teacher education aims to educate teachers to be critical reflectors, through courses and empirical studies on educational science research methods that enable teachers to develop rational justifications for their pedagogical

TABLE 2.1 Dimensions of research-based teacher education

Dimension	Critical reflector	School reformer	Academic expert
What does research-based mean?	Critical reflection, rationale for one's own pedagogical actions	Professional development, collaboration between individual and community	Inquiry, academic knowledge and critical reflection
How to educate?	Formal education in research methods and action research	Networking between schools and universities, action research	Formal academic education, integration of theory and practice through education, spiral curriculum
Who are educated?	Student teachers in teacher education programmes	Teachers in in-service training, school leaders	Student teachers in teacher education programmes, teachers in in-service training, teacher educators
Why is education needed?	General skills individuals will need in future	Reforming individuals, schools and universities	Individuals' development of expertise, extended knowhow expectations of teachers in future
Examples of studies	Afdal 2017; Afdal & Spernes 2018	Baan et al. 2019; Brown & Flood 2018; Cornelissen et al. 2011	Tryggvason 2009; Westbury et al. 2005; Østern 2016

decisions in the classroom (see Mikkilä-Erdmann & Iiskala, 2020b). The focus in this context is on the so-called general competences, which are at the centre of university studies. Similarly to other professionals, teachers are educated in a research-based way (see Afdal, 2017; Afdal & Spernes, 2018). The school reformer ideally views the research base as a means for enhancing the professional development of individual teachers but also the development of schools as learning organisations (Baan et al., 2019; Brown & Flood, 2018). Less attention has been given to this dimension. Support for classroom-based initiatives such as action research and small-scale empirical research also promotes student teachers' professional development and helps school communities to become learning organisations (see Baan et al., 2019). The ideal of the academic expert centres on learning via courses that enable students to integrate theory and practice and develop a critical 'stance' (Boyd, 2020) as essential part of their expertise. Using an enquiry method and ensuring that their investigations are informed by research, they are able to review their own teaching and develop expertise (see Jyrhämä et al., 2008; Toom et al., 2010). In the following section, we present an example of a learning environment and reflect on how the features of research-based teacher education are evident in the learning environment known as the research workshop.

3 Research-Based Teacher Education in Practice: The Research Workshop in Finnish Primary Teacher Education

The research workshop is a learning environment where student teachers learn empirical research skills; it is used from their first year of study of their bachelor's degree to the master's programme. Figure 2.1 illustrates the continuity of research methods in teacher education courses at the University of Turku. The theoretical principles of the research workshop have been derived from the notions of the teacher as a researcher (e.g., Anderson & Burns, 1989), problem-based learning (e.g., Boud & Feletti, 1997), collaborative learning (e.g., Bruffee, 1993), and expert–novice (e.g., Chi et al., 1997). The aim of the research workshop is to help student teachers develop their scientific thinking skills. More specifically, the purpose is to ensure student teachers take a scientific and critical attitude towards knowledge and that they become education experts who are active, science-focused participants in society. Educational theory and practice are therefore integrated into their studies from the very beginning so that they can grow within a scientifically literate environment. In practice, primary student teachers start to study educational theory such as educational psychology, subject studies (i.e., content of different school subjects taught

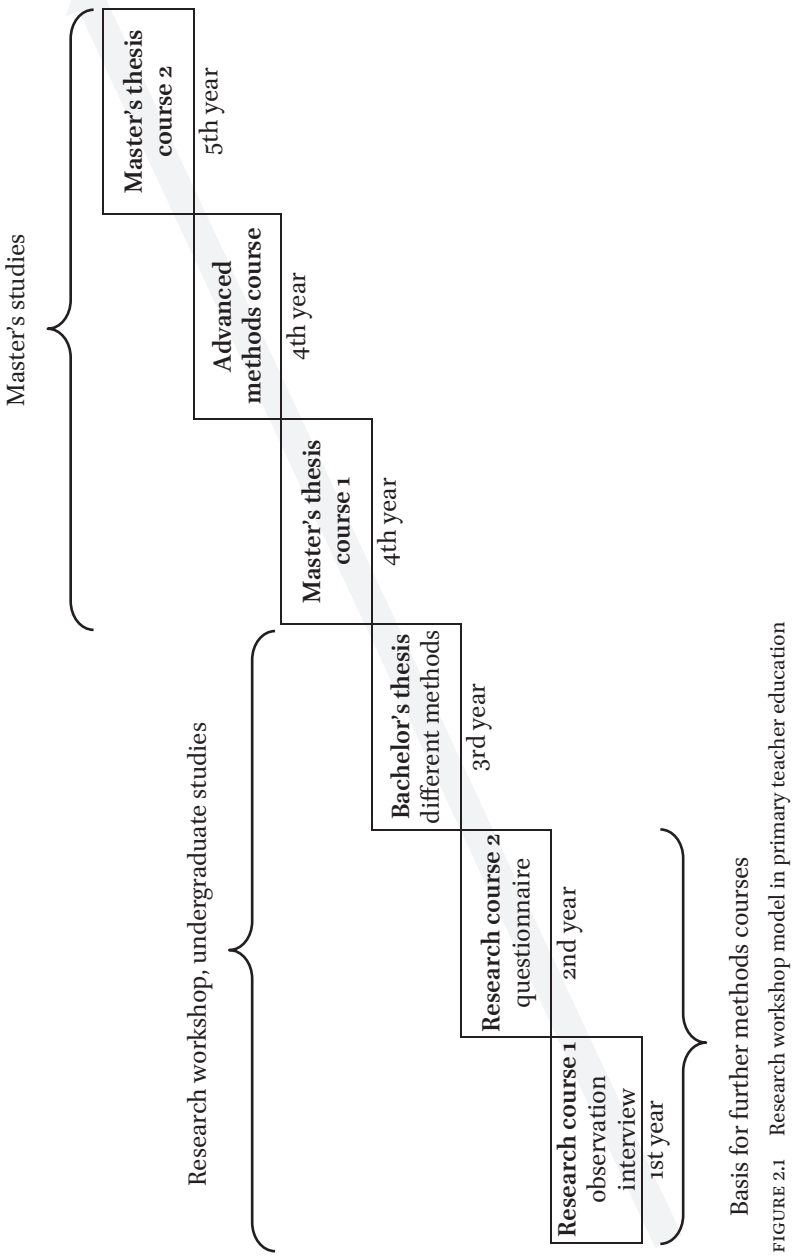

FIGURE 2.1 Research workshop model in primary teacher education

in the Finnish primary school, for instance mathematics and the Finnish language and literature), teaching techniques, and empirical research methods, from the very beginning of their studies. In parallel, students undertake practical training in order to apply the knowledge they have acquired from their in academic studies to practical situations. Finnish teacher education takes place in two contexts: academia, and university training schools, where most teaching practices are undertaken (see Mikkilä-Erdmann et al., 2019).

For example, in the first year of the research workshop, students work in small groups to write a research plan that requires knowledge of educational research methods, education psychology, subject studies, and didactics. Based on that plan, they undertake observations and interviews in their practical teacher training and collect data. After the training, the small groups write a report that follows the structure of a research article, analysing the data they have collected in order to answer their research question(s). In the second year of study, the small groups collect data from questionnaires during their practical training and analyse and report on that data in their reports. The procedure is similar to that used in the first year but the learning is deepened. In the third year, students write a bachelor's thesis alone or in pairs and move on to the Master's thesis phase (see Figure 2.1).

Throughout the research workshop, students attend seminars and lectures and are supervised by educational researchers, student tutors, statisticians, librarians, and training school teachers. Thus, individual research skills courses in the primary teacher curriculum cover research methods, information search, research ethics, data analysis methods, and scientific writing (University of Turku, 2021). Student teachers' research projects and the learning of research skills are an integral part of their studies from the very beginning right through to their fifth year. Student teachers therefore do not merely receive research-based knowledge in lecture halls, they also generate knowledge in their own right (cf. Healey, 2005). The aim of this 'research workshop' is not to train student teachers to become researchers but to facilitate a learning process, which is expected to lead them to realise the significance of educational research in teachers' practical, everyday work (University of Turku, 2021). Students, senior student tutors and teachers work together to understand education issues and to apply thinking to the school context and beyond, that is, in a wider educational context.

Our findings on student teachers' understanding of the role of research skills indicate that student teachers succeed in acquiring academic skills and are able to submit their bachelor's and master's thesis studies on time. In Finland, student teachers must work across a range of borders and gaps in the education system, such as differences in curricula between academic disciplines and

subjects and between foundation and methods courses, and navigate the major separation between school and university as two very different arenas (Sjølie & Østern, 2021). A further challenge is that the latter two contexts have different institutionalised practices and even epistemologies (Mikkilä-Erdmann & Iiskala, 2020b) with regard to the kind of knowledge that matters.

To illustrate these difficulties, Heikkilä, Iiskala, and Mikkilä-Erdmann (2020b) examined the teacher education and training programme at the University of Turku. Data were collected from the texts of student teachers' coursework. The first year student teachers (N = 79) had just finished their first teaching practice in the university teacher training school. In their reports, they were instructed to reflect on their experiences during that period. The instructions included questions on a variety of topics, including the use of research skills during the teaching practice. The analysis deployed narrative and linguistic methods (e.g. Hyvärinen, 2008).

That study viewed research skills as a means of mediating the professional agency required to integrate theory and practice. On the one hand, the student teachers associated research skills with positive outcomes for teachers' work, for instance depicting them as tools or lenses, which implied taking responsibility for their own expertise and transforming the instruction they received into their own resources as they became teachers (also Edwards, 2017). This illustrated the opportunities they had to make choices in given situations, which were noted as indicators of agency (Hilppö, 2016). The student teachers not only took on board the idea of research skills but also made the tools their own through the development of their professional interests and needs (also Clark & Hordosy, 2019).

However, on the other hand, the student teachers believed that research skills also represented a burden for teachers. On this side of the argument, they saw such skills as leading only to the conduct and publishing of research, for which they did not have the time or resources. The student teachers expressed a sense of obligation and other synonyms, detailing the restrictions that either other people or they themselves had imposed on them (also Hilppö, 2016). Furthermore, the transformative impact of the learning process on the student teachers remained to some extent unrecognisable to them, restricting their agency (Heikkilä et al., 2020b).

The study indicated that the student teachers were not entirely agentic or passive. On the contrary, they expressed different levels of agency as they integrated theory and practice and teased out the role and usability of research skills in teachers' work. The study emphasised that agency is always incomplete (Loutzenheiser & Heer, 2017), and that teacher educators should embrace this plurality. No one format will give rise to agentic teachers; however agentic

behaviour can appear when research skills studies are integrated with periods of teaching practice. The study (Heikkilä et al., 2020b) found that for teachers to gain agency from research skills, they require the space and guidance to personally recognise the significance of educational knowledge and make it their own.

In another study in the context of the University of Turku programme, Heikkilä et al. (2020a) found that first-year student teachers were already finding research skills helpful in several ways. The data and analysis methods were similar to the methods referred to above, although the participants were different (coming from a different study year). The study aimed to examine the epistemic agency (Damşa et al., 2010) expressed by student teachers when engaging with research skills. Four dimensions of epistemic agency emerged in the contribution of research skills to the student teachers' approach to knowledge. All the dimensions revealed a distinct way of exercising epistemic agency through research skills (Heikkilä et al., 2020a).

First, the dimension of the self related to the student teachers' professional development, with epistemic agency directed at their own teaching. Research skills were a tool for questioning oneself and one's teaching practices. In the second dimension, that of the class, epistemic agency was directed outwards, towards events in the classroom and the characteristics of the children. Here, research skills related to systematic observation and analysis in an attempt to understand pupils and their backgrounds. The third dimension – research literature – involved critically relating oneself to existing research-based information, and research skills were used to interpret educational knowledge and assess its validity. Fourth, the dimension of everyday life emphasised the student teachers' needs to see teachers' work in a wider context. Research skills were deployed here to support teachers with the transmission of knowledge to their pupils and to demonstrate connections between learning at school and the outside world (Heikkilä et al., 2020a).

The study revealed how, in order to foster agency, attention has to be paid to student teachers' relationships with knowledge. It also prompted reflection about the purposes of research courses, which have become increasingly important given the increasing challenges to research-generated knowledge (Jensen et al., 2012). The study indicated that those purposes are several: to learn to reflect on oneself as a professional; to observe one's surroundings more clearly; to get more out of the writings about the field; and to deal with the outside world with its fake news and 'alternative facts', which requires a critical and active relationship with knowledge. The conclusion is that all of these aims are relevant to student teachers (Heikkilä et al., 2020a).

Although some student teachers mentioned a number of dimensions, most of them seemed to focus on only one. The study concluded that the attention

of student teachers could be drawn to the capability of all four dimensions to increase epistemic agency, highlighting great potential that has not yet been tapped in teacher education (Heikkilä et al., 2020a). There has been concerns that student teachers may not recognise the importance of studying research skills (Puustinen et al., 2018). However, they regard mainly subject teacher students who study educational sciences only one year, compared to primary teacher education programme with 5 years' training in educational sciences.

Hence, it is important to clear up misconceptions that putting research skills into practice in the classroom differs from teachers' 'real' day-to-day work; in the best case, research skills become innate and can help teachers to focus on children and their learning. Finally, the two research workshop studies indicate that teacher educators should be optimistic about student teachers' capacity to make versatile connections with educational research from their very first year of study.

4 Discussion

In this article, we argue that research-based teacher education helps teachers to become epistemically responsible and skilful professionals. In the best cases, research and teaching are well integrated in academic teacher education during different phases so that students can better understand the connections between different knowledge bases, both during their programme and later in their professional life. Although the status of Finnish teacher education is high, it has developed in response to historical contingencies and is therefore open and vulnerable to change (Simola et al., 2017). Student teachers need learning environments like the research workshop model to help them become aware of the different epistemologies and to overcome the gap between theory and practice. In addition, students' 'critical stance' needs to be activated and fostered by teacher educators in order to shape their approach to classroom situations and interactions: there should be a reciprocal relationship between research and practice. Professionals in general, in this case teachers, must learn to apply theoretical knowledge in their work, and, in turn, apply theoretical concepts to the interpretation of phenomena (Tynjälä et al., 2014).

The role of the teacher in today's societies is changing. In countries like Finland, the curriculum and textbooks used in schools are based on the latest scientific knowledge. Curriculum guidelines are issued at national level but the curriculum is delivered at municipal and school level. So Finnish teachers have a lot of freedom with regard to implementing the guidelines via their planning and teaching. Finnish teachers are autonomous when it comes to evaluating their students. There are no inspectors or obligatory standardised tests

in Finnish schools. This autonomous and powerful evaluatory role has to be taken seriously. Teachers' deployment of research skills and adoption of a critical stance can ensure that evaluations are reliable, valid and ethical. We would thus argue that teachers should themselves have high scientific literacy and the skills to teach these skills to their students. Teachers work as gatekeepers, mediating between scientific knowledge and everyday knowledge, particularly in an era where the latter is often influenced by emotions and post-truth era interpretations. The teacher plays an essential role in modelling and teaching critical enquiry skills, i.e., scientific literacy.

Teachers in schools are no longer only mediating between the world of scientific knowledge and the world of everyday knowledge; they are also to some extent mediating between scientific knowledge and the internet. Teachers are expected to support and teach students how to find and evaluate the reliability of knowledge that is often disseminated via different internet sources. Even for educated adults, this can be difficult because such knowledge may seem – and partly be – true; but it is often a mixture of so-called synthetic knowledge, even consisting of misconceptions. These are what are known as multiple source reading skills (Rouet et al., 2007) and the ability to teach such skills is becoming very important in the current post-factual era.

Finnish universities providing academic primary teacher education have many important goals, as they do in other countries. We need to teach students the latest scientific knowledge and theory, i.e., educational science. At the same time, we have to help student teachers understand and practise their different roles, namely to socialise children so that they become responsible members of society, and to teach the skills they will need both now and in the future. Teacher education must thus enable student teachers to become aware of these different roles and the values behind them, and to acquire the skills and knowledge required to perform them.

To support the theoretical and empirical development of Finnish teacher education, a research-based Multi-dimensional Adapted Process (MAP) model of teaching (Metsäpelto et al., 2021) was created, collaboratively at national level. The MAP model brings together and sets out the competenc(i)es needed for teaching. It also strengthens the theoretical and empirical underpinning of the continuum of teachers' professional development. The model is used, for example, to assess the suitability of candidates for programmes and in the development of teacher education curricula.

One particular challenge in teacher education compared with other academic programmes is that when students are selected for the teacher education programme, they already have approximately 12 years' experience in schools, namely in their future workplaces. Lortie (1975) called this the apprenticeship of observation. These observations can sometimes be a challenge and

require student teachers to change their approach and previous assumptions with regard to teaching and its professional underpinning (Mikkilä-Erdmann & Iiskala, 2020b).

As a profession, teaching requires its practitioners to continuously adapt to events as they unfold in the classroom and tailor their professional judgement to the specific characteristics of individual situations (Biesta, 2007). Teachers' strong relationship with knowledge is integral to the autonomy of their profession (Hermansen, 2017). In research-based teacher education programmes, teachers' professional knowledge is highlighted. However, becoming a teacher entails challenges that student teachers must be aware of. Higher education institutions, where student teachers study, are focused on the production and dissemination of research-based knowledge, whereas teachers' work in schools concentrates on educating children and young people (Risan, 2020). Higher education and schools represent distinct knowledge cultures that serve different purposes and make different assumptions about what is considered legitimate knowledge (Knorr Cetina, 1999). The interplay of different knowledge cultures is an essential aspect of any professional field. It cannot be 'solved'; students must learn to live with it.

Although it is important to give student teachers opportunities to practice their teaching, adding more practice to teacher education programmes downplays both the potential of student teachers and the work of primary teachers. Student teachers can be supported on the job to become epistemically productive, working with scientific knowledge and tools that strengthen their opportunities for creative engagement with professional knowledge. It is thus a fundamental premise of research-based teacher education that research skills and student teachers' own research assist them to see and interpret their experiences in schools in ways that would otherwise not be accessible to them (Hughes, 2019; Mikkilä-Erdmann et al., 2019). Research skills, as a key component of research-based teacher education in Finland, are central tools for integrating knowledge into teacher education. However, the balance between theoretical studies and guided teaching practice must be sustained in order to avoid the decontextualisation of teacher education (see Puustinen et al., 2018).

5 Conclusions

Challenges to teacher education also arise from societal circumstances, and these are reflected in teachers' work. Finnish society, like many European societies, is undergoing massive changes, such as the increase in multiculturalism and multilingualism, demographic changes, and crises related to the environment,

health, and security. Teacher education thus needs to acknowledge more directly teachers' role as societal influencers. The various roles of teachers, and the values underpinning the teaching profession, should be discussed.

The development of a continuum of research-based teacher education in Finland was the focus of the recent reforms of the student selection phase. The MAP model fosters the research-based continuum in teacher education. Continuing and extending the national collaboration that led to the creation of the MAP model and the selection phase, the eight universities involved have begun to put together the Finnish Teacher Education Database (FinTED), an infrastructure designed to support not only research on teacher education[1] but also research-based teacher education itself. Further work remains to be done on the in-service phase.

A critical question is how to support teachers' learning and professional development as a continuous process from student selection to the in-service phase through to the working life phase. The idea of a continuing path of professional development running from preservice to in-service is important. There is still much to do to link the three phases more closely together. The last phase, teachers' ongoing learning, is the phase that needs the most attention and reform, in many other countries as well as Finland. Teachers receive an advanced, research-based education and gain a degree, but in Finland, after they leave university and begin working, their education is very scattered and not very based on research. Mentoring programmes, and personal and social support for early-career teachers have been shown to be important in fostering versatile teachers and for securing their position in schools and the professional community (Symeonidis et al., 2023). National collaboration and dialogue have been central ways of supporting the autonomous role of universities in developing research-based preservice teacher education in Finland. In the future, research-based teacher education should support both newly qualified and experienced teachers both socially and emotionally.

Our article deals with teacher education in the national context of Finland. This context could be of interest internationally, since Finnish teacher education has a reputation for being high quality. The Finnish context does present challenges with regard to research 'on' and 'in' teacher education and some of these challenges can be seen as international or even global. Sustainability, segregation, well-being, and future competenc(i)es, for example, are linked to teacher education at international level too. New courses of action are required to tackle these global challenges. Three of our main conclusions are therefore applicable beyond national borders.

First, there is a lack of data and research infrastructure on/in teacher education. There is a tendency to pursue large-scale and longitudinal data and

studies (e.g., Mayer & Oancea, 2021). Furthermore, a variety of research methods is needed in order to gain a general picture of the quality of teacher education. In Finland, we are trying to address these challenges by collaborating nationally to construct the national database for teacher education (FinTED). Infrastructures to support teacher education research should be constructed and/or strengthened.

Second, research on/in teacher education should look at the system as a whole. Different levels of the system should be examined. Typically, the focus is on the local level (teacher education programme/university level). Broader and more systemically gathered data sets are needed. In Finland, FinTED will enable national-level data to be produced. More countries might be interested in gathering such data on/in teacher education. It would also be interesting and beneficial to collaborate at European or even global level to produce large data sets.

Third, the importance of collaboration in teacher education research could be highlighted more. It should be based on voluntary collaboration, cooperation and dialogue, not top-down approaches or obligatory evaluations dictated by the authorities or international organisations. Universities should be autonomous agents when it comes to research on/in teacher education. In Finnish society in general and in teacher education research in particular, collaboration/dialogue and agency/autonomy are key. These should also be the key concepts for research on/in teacher education.

Collaborative work covering different systemic levels and supported by research infrastructures will enable us to develop higher quality teacher education research. The value of teacher education research is vast, because it will enhance teacher education and thus improve the quality of education in societies. High quality education, in turn, is essential to the creation of a sustainable global future.

Note

1 https://sites.utu.fi/finted/en/

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