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Learning to Teach in Out-of-University and Out-of-School Environments in Primary Teacher Education in Estonia, Finland, and Sweden

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Learning in diverse settings during pre-service teacher training equips future primary teachers with the knowledge and skills to teach in authentic learning environments later in their work lives. This experience helps to meet the varying needs of their future students who have increasingly diverse cultural and socio-economic backgrounds with varying levels of access to learning and knowledge. During their university studies, pre-service teachers need to recognise the value of out-of-school environments, reinforce awareness in practice, and reflect on experiences to deepen pedagogical thinking about learning environments. This multiple case study describes the common practices in the pre-service training of primary teachers at Tallinn University, University of Helsinki and Uppsala University concerning teaching in out-of-classroom learning environments. Our aim was to explore the ways that the three universities support pre-service primary teachers in using out-of-school learning environments in their future practice. We intended to identify practices regarding our respective national curricula and university courses for pre-service primary teachers. We have three main suggestions for teacher educators regarding learning to teach in diverse environments: enable meaningful and reflective practical tasks in out-of-university learning environments for pre-service teachers; ensure the sustainability of external partnerships by stating collaborative practices in course programmes while leaving flexibility in the details; and reflect on professional networking across the boundaries of institutions.

Keywords: learning environments, pre-service teacher training, primary teacher education, reflective practice, case-study

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Učenje poučevanja v zunajuniverzitetnih in zunajšolskih okoljih v izobraževanju osnovnošolskih učiteljev v Estoniji, na Finskem in Švedskem

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Prek učenja v različnih okoljih v okviru usposabljanja prihodnjih učiteljev opremljamo prihodnje osnovnošolske učitelje z znanjem in s spretnostmi za poučevanje v pristnih učnih okoljih v poznejših obdobjih njihove poklicne poti. Ta izkušnja jim pomaga zadovoljiti različne potrebe njihovih prihodnjih učencev, ki imajo vedno bolj raznolika kulturna in socialno-ekonomska okolja z različnimi stopnjami dostopa do učenja in znanja. Med univerzitetnim študijem morajo predšolski učitelji prepoznati vrednost zunajšolskih okolij, krepijo zavedanje v praksi in razmišljati o izkušnjah, da bi poglobili pedagoško razmišljanje o učnih okoljih. Ta študija več primerov opisuje skupne prakse pri usposabljanju prihodnjih osnovnošolskih učiteljev na Univerzi v Talinu, Univerzi v Helsinkih in na Univerzi v Uppsali glede poučevanja v zunajšolskih učnih okoljih. Naš cilj je bil raziskati načine, kako te tri univerze podpirajo prihodnje osnovnošolske učitelje pri uporabi zunajšolskih učnih okolij v njihovi prihodnji praksi. Nameravali smo identificirati prakse v povezavi z nacionalnimi učnimi načrti vseh treh držav in univerzitetnimi predmeti za prihodnje osnovnošolske učitelje. Za izobraževalce učiteljev imamo tri glavne predloge glede učenja poučevanja v različnih okoljih: omogočiti smiselne in reflektivne praktične naloge v zunajuniverzitetnih učnih okoljih za prihodnje učitelje; zagotoviti trajnost zunanjih partnerstev z določitvijo praks sodelovanja v študijskih programih, pri čemer je treba ohraniti prožnost pri podrobnostih, in razmisliti o poklicnem povezovanju prek meja institucij.

Ključne besede: učna okolja, usposabljanje prihodnjih učiteljev, izobraževanje osnovnošolskih učiteljev, reflektivna praksa študija primera

Introduction

To adapt to the ever-changing world, children need to achieve personal fulfilment, form meaningful relationships, and learn how to learn (Sala et al., 2020). Learning exclusively in the classroom during formal schooling will not provide the wide range of experiences and knowledge students need to achieve such broad goals. Diverse learning environments are seen as a way to engage students in meaningful learning, and introducing 'support actions that engage learners in meaningful real-life problem-solving situations, within education, workplace and other learning environments' has been recommended (European Commission: Directorate-General for Research and Innovation, 2015). Also, field trips offer an opportunity to discover the learning resources of the local community (Nabors et al., 2009), familiarising students with informal learning opportunities. Thus, it is not surprising that field trips are seen as a possibility to support students' life-long learning by some primary teachers (Kisiel, 2005).

Students' access to and habits of using different learning environments varies. Working frequently outside classroom boundaries in different authentic environments is a way to address the unequal distribution of awareness and access to various cultural, societal, and scientific resources and learning environments among primary students (Greene et al., 2014). Such inequities often echo social segregation as it plays out in the intersection of socioeconomic status and access to cultural institutions in society. Moreover, students also aspire to much more diverse and open learning environments during school compared to the settings in which they are normally taught (Kangas, 2010).

Many possibilities to expand learning environments for primary students exist. On the one hand, natural environments and the surroundings of school premises, such as streets, shops, parks, forests, beaches, public transportation, and the like, offer an unstructured environment where teachers are free to explore necessary content together with students. For example, playgrounds are emphasised as effective learning environments to support students' physical activity level (cf. Kangas, 2010). No reliable statistics exist about how often primary teachers in Estonia, Finland, or Sweden teach in such unstructured learning environments, but there are some indications that it is a common but uneven practice (Henriksson, 2018; Kink, 2013; Schmidinger et al., 2014). Moreover, teachers with more teaching experience use such unstructured learning environments more often than teachers with less teaching experience (Novljan & Pavlin, 2022).

On the other hand, institutions of science and culture, such as museums, science centres, art galleries, zoos, and similar, provide a deeply thematic

and organised environment for learning and are often equipped with experienced educators who can support teachers during field trips. For example, curriculum-related learning activities in museums and science centres have been found to be beneficial for learning content matter and inspiring students' career choices (DeWitt & Storksdieck, 2008), as well as increasing motivation (Paris et al., 1998). Taking part in learning activities led by another educator is probably not as common as using unstructured learning environments because organisation, teaching and learning in such situations are more complex (Uppin & Timoštšuk, 2022). The complexity of such field trips is induced by their boundary-crossing nature. Boundaries can be defined as 'socio-cultural differences leading to discontinuity in action or interaction' (Akkerman & Bakker, 2011, p. 21). In the case of working with another educator, the schoolteacher has to not only teach in a novel environment but also deal with the socio-cultural differences of learning environments by collaborating with an educator who might not share the knowledge nor the language about teaching and learning (Vesterinen et al., 2017).

Moreover, learning in out-of-classroom settings is beneficial for students' socio-emotional development (Yıldırım & Akamca, 2017). Socio-emotional skills are crucial for students' well-being and future academic success. For example, some museum learning activities have specifically been designed and proven to support the development of historical empathy of primary school students (Almqvist Nielsen, 2023). Furthermore, experienced Estonian primary teachers consider the possibility of enhancing peer and teacher-student relationships as an added value and sometimes even the primary aim for out-of-school learning activities (Uppin & Timoštšuk, 2022).

Knowledge and awareness about the range of benefits of learning across environments make teachers more prone to teaching in diverse environments (Kisiel, 2013; Seligmann, 2014). Thus, didactic courses in pre-service training should also address teaching in out-of-classroom environments. Moreover, teachers who rarely go on field trips tend to have a significant amount of apprehension towards them, believing they are too time-consuming, expensive and/or difficult to organise. In contrast, avid museum-goers do experience stressful organisational problems (Arik, 2022; Uppin & Timoštšuk, 2022) but are resourceful in overcoming them and believe that the value of field trips compensates the challenges (Uppin & Timoštšuk, 2022). Knowledge about, as well as experience of, logistical issues and curricular norms, can ease anxiety about organising field trips during teacher training.

Practical teaching tasks and observations in out-of-university or out-of-school learning environments, especially when in collaboration with educators

from other institutions, increase awareness about learning in different environments. In addition to awareness, pre-service teachers who have opportunities to learn and teach in out-of-university and out-of-school learning environments start to view them as places that can enhance their classroom instruction with suitable content and pedagogy (Kisiel, 2013). In-service teachers of social studies who have had the opportunity to practise teaching in out-of-school learning environments are prone to use authentic teaching strategies and historical evidence in instruction (Coddington, 2020).

Previous research concerning science teachers has shown that out-of-university teaching experiences have the potential to improve pre-service teachers' methodological knowledge (Morentin & Guisasola, 2015), expand content knowledge (Kisiel, 2013), increase interest in the content matter (Tasdemir et al., 2014), and the ability to meaningfully integrate different subjects (Domenici, 2022). Primary pre-service teachers, in particular, have also been shown to expand their knowledge of contemporary science and science learning through courses held in science centres (Avraamidou, 2015). Moreover, the benefits of pre-service teacher training are manifold: pre-service teachers' active presence in educational teams of partnering organisations, such as museums, strengthens the teaching practices of museums as well (Seligmann, 2014).

Designing learning experiences for pre-service teachers always entails reflection. It cannot be assumed that all pre-service teachers know how to reflect, and therefore, teacher preparation programmes should introduce and guide pre-service teachers to reflect and identify its value during the learning process (Huisman & Edwards, 2011). The perceived value of reflection is more critical in developing cultural competence than the 'amount' of reflection (Kahn et al., 2014).

The aim of this study is to explore the ways in which universities currently prepare pre-service primary school teachers to use out-of-school learning environments in their future practice in the light of national curricula. Based on the results, we also aimed to identify recommendations for teacher education institutions to strengthen opportunities to integrate out-of-school learning environments in their programmes. To fulfil this aim, we posed two questions:

1. How do national curricula for primary schools in Estonia, Finland, and Sweden support learning in out-of-school environments?
2. How is learning in out-of-university and out-of-school environments supported by selected primary teachers' curricula in Estonia, Finland, and Sweden?

Method

Participants

We present the cases of three primary teacher education programmes at Tallinn University, University of Helsinki and Uppsala University, which jointly undertook a strategic partnership project (2019-2022) to strengthen teacher education through school-based research and innovative practice (see more at <https://www.edu.uu.se/collaboration/depter/>). The core teams of primary education departments from each university formed the initial project team and participated in the preparation of this manuscript. In addition, 22 teacher educators in total and 59 pre-service teachers participated in the project throughout its three years of execution. We do not report data from these participants, this article is solely based on the information about institutional practices shared among project partners in the various activities organised during the project.

The collaboration between these countries and specific primary teachers' programmes was seen as necessary and meaningful because, in addition to being geographically proximate, the education systems of Estonia, Finland and Sweden have important characteristics in common. In these countries, Protestantism has historically influenced the spread of general schooling (Feldmann, 2018), an egalitarian approach towards education is valued (Volmari, 2019), social policies ensuring equal access to education are evident (Volmari, 2019), and a master's level degree is required for primary teacher certification (Volmari, 2019). In-service primary teachers in Estonia, Sweden and Finland work full-time with the same student group, often continuously for three to six years, allowing them to develop deep insight into their students' individual needs and preferences. Subject teachers obtain their degrees and research experiences in their respective fields, complemented with studies in education. Whereas primary teachers are expected to be experts in a variety of subjects *and* educational issues, they are also expected to plan and execute a research project (Master's thesis), which provides them with tools for meaningful pedagogical reasoning (Kansanen, 1991, 2003). In Estonia, Sweden, and Finland, the focus of primary education is on the holistic development of the child.

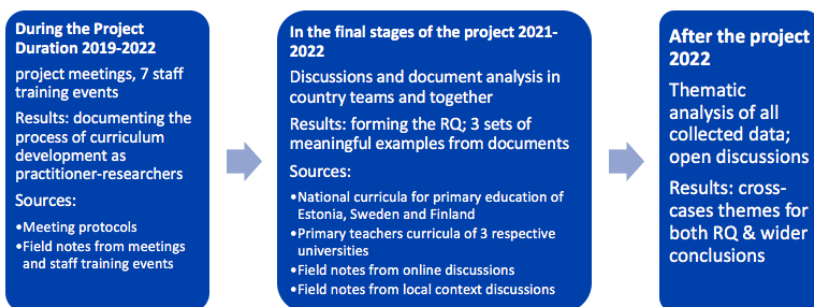
Nevertheless, the organisation and specific aims of primary education programmes in universities and trends in national educational reforms are different. For example, the majority of Estonian pre-service teachers work as full-time teachers by their fourth year of studies (mostly due to economic reasons). Moreover, yearly enrolments of the three primary teacher programmes involved in this research differ (25 students in Tallinn University, 40 in the University of Helsinki, and 170 in Uppsala University).

Research design

This multiple case study (Yin, 2009) conceptualises the results of a strategic partnership project between three universities (see Figure 1). We considered the three primary teachers' preparation programmes (curricula in a wider sense) as cases. The aim of the project was to develop our departments' primary education programmes through school-based research, or in other words, find meaningful ways to cross the theory-practice divide. It has been suggested that practice can be oriented towards expansive learning and adaptive expertise through design thinking (Ruus & Timoštšuk, 2014). Thus, we enabled open discussion and inclusion of different stakeholders within teacher education. For example, some seminars and other activities during staff training events were open to all university staff, pre-service teachers, and in-service teachers.

Figure 1

The process of the case-study research



The project revolved around six core topics, intellectual outputs were created, and a staff training event was held for every topic: innovative practices (January 2020); action research to enhance student teachers as inquiring practitioners (April 2020); research ethics in school-based inquiry (September 2020); subject-integrative/phenomenon-based teaching and learning in primary teacher education (April 2021); out-of-school and engaging learning environments in primary teacher education (September 2021); integration of the innovative practices in primary teaching into teacher education programmes (January 2022). Topics of the intellectual outputs and relevant staff training events were somewhat overlapping, which enabled us to merge ideas and reflect more deeply on each aspect. One of the most discussed topics during the project was the use of different out-of-classroom settings.

The discussion on how to share our experiences concerning out-of-classroom learning environments started at the end of 2021 because, by that

time, it was evident that our experiences could also be valuable for others. We highlight the fact that the document analysis was done by practitioners who have knowledge of both the written and the 'hidden', 'actual', or 'perceived' curriculum (Kelly, 2009; Behar-Horenstein, 2018) regarding both the national curriculum and university primary teachers' curricula. Moreover, we had just been part of a lengthy project, simultaneously sharing our practices and collectively reading academic articles on a given topic. Therefore, on the one hand, the analysis was influenced by our collective experience, but on the other hand, we could use our insights about practice to identify gaps between this and curriculum texts. Thus, we have chosen a way to define the curriculum in a way that, to some extent, reaches the 'actual experiences of the pupils' (Kelly, 2009, p. 13) without having interviewed or surveyed students.

Moreover, the research questions were formed only at the final stages of the project (see Figure 1), at which point we started organising our collective experience as a case study. Nonetheless, a somewhat nonlinear process and the simultaneous writing of the theory and results are consistent with the case-study format (Yin, 2009). We acknowledge the limitations of our deeply contextual results, especially considering that information about learning environments is relatively scarce in the written documents that guide teaching and learning in primary schools and universities.

Data collection

As a first step, we collected meeting protocols and field notes from all meetings and training events organised within the strategic partnership project between our three universities. Six staff events and additional preparatory meetings were held. All meeting protocols were written by the authors of this paper and shared with all participants during the project. We, as the authors of this article, acted as practitioner-researchers (Jarvis, 1999) throughout the project, documenting (including collecting personal field notes), presenting, comparing, and analysing relevant information to improve our practice. Throughout the project, we gave insights into the practice of our respective primary teachers' preparatory programmes and local contexts and shared our experience and knowledge as teacher educators of future primary teachers. During the project, we discovered the gap in previous literature regarding using and teaching using out-of-classroom learning environments during primary teachers' preparation, especially from the viewpoint of teacher-educators from our countries. We pursued open discussions to frame the most meaningful insights about out-of-school learning environments. The discussions that took place during the project and collectively revisiting the previously collected documents amongst

the authors gave us the backdrop and a lens to describe and compare the ways the primary teachers learn and are prepared for teaching in out-of-school and out-of-university environments in our respective universities.

To bring our experiences, knowledge, and the results of the project into a wider perspective, we then analysed primary teachers' curricula and national curricula of respective countries and our own institutional course descriptions in the light of previously collected material. The process of analysis of the national curricula and course descriptions followed a thematic analytical procedure (Braun & Clarke, 2006) in which we looked for explicit utterances of out-of-class teaching and learning in our respective national curricula and our local teacher education curricula. We analysed documents in three national contexts; researchers from each country worked as a team to analyse the documents pertaining to their context and ensured an agreement of interpretations in this process in 2022. Finally, we extracted overarching themes for both research questions in cross-case analysis and made wider conclusions.

Results

In the first subsection, we describe and provide examples of how the national curricula of Estonia, Sweden, and Finland support learning in out-of-school environments. In the second subsection, we describe and provide examples of learning to teach in out-of-school and out-of-university learning environments during primary teachers' programmes in our respective universities.

Learning in different environments according to national curricula

We found supportive features, ranging from very specific suggestions for certain topics to overarching principles of organising learning for introducing different learning environments from the primary national curricula of all participating countries. We identified three overarching themes while analysing national curricula in the light of data gathered from the project: non-specific language and lack of defined norms considering learning in out-of-school learning environments (e.g., on the state level there are no regulations on how often students should learn outside the classroom or go on longer field trips); contrasting views to justify learning in out-of-classroom environments in the documents: skills and competencies on the overarching (higher, strategic) level but mostly specific content-knowledge or content related skills on discipline (lower) level; interdisciplinary approach (e.g., phenomenon-based learning) as

a supportive mechanism to incorporate out-of-school learning environments.

Thematic or phenomenon-based learning in primary school is relatively common in all three participating countries. Such an integrative approach is suitable for thematic expositions and out-of-classroom environments that are not divided into classical school subjects. Experienced primary teachers are already prone to integrate different fields of study and combine content learning with skill development during field trips (Uppin & Timoštšuk, 2022). The examples chosen by the representatives of each country largely echoed the relevant issues connected to learning in out-of-school environments as perceived by the teacher-educators. We present examples from each country here.

Learning life skills plays an important role in the Finnish national curriculum

In Finland, the national curriculum for basic education places increased weight on teacher collaboration and authentic learning surroundings (Vesterinen et al., 2017). The curriculum involves seven transversal competence areas that reflect the aims of Finnish primary school education and the competences needed in all spheres of life. The construction of competences includes knowledge, skills, values, and capacity (National Core Curriculum for Basic Education, 2014). With regard to these areas, the Finnish curriculum emphasises that every student is unique, heard, valued, and encouraged.

The transversal competences include thinking and learning-to-learn, cultural competence, interaction and expression, life skills, multiliteracy, ICT competence, working life competence and entrepreneurship, participation, involvement and building a sustainable future (National Core Curriculum for Basic Education, 2014). For the development of these competencies, the curriculum emphasises and recommends the use of various outdoor environments as learning environments. When learning working life competence and entrepreneurship, the primary students should be provided opportunities to cooperate with stakeholders outside the school. When learning multiliteracy competences, project work and subject integration in and out of school should be utilised on a regular basis. The learning environment should offer creative opportunities for students to analyse and investigate a variety of questions from multiple perspectives and provide opportunities for students to learn new knowledge and skills (National Core Curriculum for Basic Education, 2014). Prior research backs up the implementation of these goals showing that Finnish primary school teachers use out-of-school learning in their teaching and nature is actively drawn upon as a context and a resource (Henriksson, 2018).

Life-long learning and participating in society are the main focus of the Swedish national curriculum

The Swedish National Curriculum frames the right to an education that allows students to develop and inspires lifelong learning by preparing students for active engagement in society through participation, evaluation, and choosing of content for their teaching (Curriculum for the Compulsory School, Preschool Class and School-Age Educare (Lgr11), 2018). These activities are connected to the fostering of virtues such as creativity, inquiry, problem-solving, independence, and skills in working collaboratively. Cooperation with the surrounding society is an important factor in achieving these overarching goals. Swedish teachers turn to the individual subject syllabuses' general guidelines for teaching content and knowledge requirements to meet overarching goals. Some specific examples that address teaching in out-of-classroom learning environments are excursions and experiments in Biology, field trips to investigate natural and cultural landscapes in Geography; and year-round, daily physical activities and play in various local outdoor environments in Physical Education.

In Sweden, the introduction chapters to the national curriculum express the importance of making connections between the classroom and greater society (Curriculum for the Compulsory School, Preschool Class and School-Age Educare (Lgr11), 2018). It is clearly stated in the curriculum that the responsibility of opening up access to society at large falls both on the teachers and the entire school community; the curriculum also states that 'teachers should organise and carry out the work so that students have opportunities to work along interdisciplinary lines' (p. 13) This joint effort of outreach initiatives should take place together with organisations and institutions that support activities of the school.

Learning outside the classroom is highlighted in the Estonian national curriculum

The Estonian curriculum for basic schools (Estonian National Curriculum for Basic Schools, 2011) states that studies can be organised in virtual spaces and outside the school premises as long as the safety of students is provided. Using out-of-classroom learning environments is suggested in most subject fields but mostly in vague terms (notably, no such examples are recorded in the maths curriculum). Thus, learning in different authentic environments is seen as a natural part of primary education from the legislators' side.

However, Estonian teachers are autonomous in interpreting the curriculum; teachers are not mandated to teach in any suggested learning environment. For example, there are numerous specific examples of practical tasks that

could be implemented outdoors (e.g., learning species of specific ecosystems), but teachers can decide to implement them at school or by using digital tools. The relative autonomy of the teachers is considered one of the strengths of the Estonian education system (Tire, 2021), and by no means do we want to convey the message that specific ways of using out-of-classroom learning environments should be somehow forced upon teachers.

The general competencies also state that students should 'sense and value one's ties with other people, nature, the cultural heritage of one's own country and nation and those of others, and events in contemporary culture; to value art and to shape the sense of aesthetics.' (Estonian National Curriculum for Basic Schools, 2011, para. 4 Competences). Estonian primary school teachers take their students not only out in nature and to museums but also to theatres, concerts, the cinema, and similar places (Kink, 2013).

Although there are numerous opportunities for free-of-charge out-of-classroom activities funded by local municipalities or governmental institutions (especially for learning activities related to science), the know-how of teachers about where to apply for funding or find those free-of-charge activities varies quite a lot (Klettenberg, 2022). Thus, it is standard for Estonian parents to fund a large proportion of such excursions from their own pockets (Klettenberg, 2022). Teachers do consider the socio-economic background of their students and try to make sure that all students are included (Uppin & Timoštšuk, 2022). According to primary school teachers who go on field trips frequently, parents usually value such outings, often ask for them and are willing to pay for them even when they are not directly connected to the curriculum (Uppin & Timoštšuk, 2022). In contrast, parents are also perceived as a great source of external pressure by Estonian primary teachers (Näkk & Timoštšuk, 2021); thus, it is possible that parents influence field trips even more than previously understood.

Learning about teaching in different environments as part of pre-service teachers' university curriculum

With regard to the second research question, we identified three more general themes that structure the background thinking of our local curricula and their development based on the literature and material collected from the project, specifically, 1) creating awareness, 2) positive experiences about learning across settings, and 3) supporting reflection skills of pre-service teachers. These broad categories were used as a coding frame for analysis. We present examples from these categories which illustrate how learning in different settings is supported in our universities' curricula.

University of Helsinki

We limit the examples of outdoor and museum education from Finland to compulsory Master's level studies in primary teacher education, which has gained less attention than those reported within the bachelor's level (Wolff & Ehrström, 2020).

One of the courses offered for the students of the entire faculty, aptly titled *Topical Issues in Educational Research*, takes its point of departure in existing research and a design-based research approach and extends the learning experience to contexts outside the university lecture hall. In this course, students collaboratively identify a challenge, create a means of tackling it, and disseminate knowledge about their solution. The pre-service teachers seek external feedback to develop their ideas. At the end of the course, they present their innovation at a conference organised by the faculty. Finally, they reflect upon the development process in a portfolio. In this course, in which pre-service teachers develop innovative educational products, they learn new working life competencies, develop skills in entrepreneurship and are involved in building a sustainable future. Practising the mentioned competencies provides an opportunity to understand the pedagogical premises that also underpin the requirements of the national curriculum.

The advanced practicum provides another example. It contains observation, co-teaching, individual teaching, and tasks in relation to professional development. While outdoor education and museum pedagogy are not explicitly mentioned, excursions, theme days, and school projects are mentioned in the practice guidelines. Students are encouraged to study the school's local curriculum from the perspective of multilingualism, diversity and/or social justice and plan a theme day or an out-of-classroom learning activity. The thematic focus on diversity, multilingualism, and social justice of the primary school teacher education track for educating teachers for schools with Swedish-language instruction encourages pre-service teachers to reflect on content and practice through a critical lens. Awareness creation and reflection permeate every course.

In their fourth year of study, pre-service teachers take part in a course focusing on teachers' professional identity and teachers as developers of their profession. Pre-service teachers explore pedagogical research, both individually and in collaboration with peers, and deepen their understanding of what it means to be a reflective practitioner (Schön, 1987) and of the relationship between theory and practice. One of the aims of the course is, according to the foci of the teacher education track in question, to encourage pre-service teachers to analyse their professional identity as a teacher in a diverse society.

The unit makes use of interactive and visual practices that connect the student teachers' reflections on their professional identity to external contexts. Student teachers often use their own photographs to illustrate their own learning. The employment of images in the exploration of teacher identity extends learning to include real and metaphorical settings, and it is not uncommon that the images collaboratively chosen by student teachers convey extended notions of settings in which learning takes place. Indeed, the images seldom visualise traditional classrooms or lecture halls. To our understanding, this exercise facilitates student teachers' exploration of identity development and learning as taking place in a variety of different contexts, and this idea is highly transferable to teaching in the school context.

The theme of the thesis research, which all pre-service teachers carry out as part of their master's degree, is chosen by the pre-service teachers themselves. The thesis research often reflects the focus of teacher education (diversity, multilingualism, and social justice), and the theme of out-of-classroom learning contexts has been chosen occasionally.

In addition, the programme offers a non-compulsory course on sustainable World Heritage learning through a phenomenon-based approach. Readers interested in this course are referred to Wolff, Vivitsou, and Aarbakke (2022) and Heikkilä (2022).

Uppsala University

The syllabus for the primary teacher programme does not explicitly mention out-of-classroom learning environments. The general description of the programme mentions the possibility for student teachers to study abroad for theoretical or practicum courses, thus learning in different global environments. There are, however, examples at the course level of students exploring various out-of-classroom learning environments within disciplinary courses, such as in Biology or exploring historical environments in Social Sciences.

The size of the primary teacher programme is one constraint in utilising out-of-university environments. It has approximately 1,200 students, and each cohort of students is about 170 students. Thus, the mere logistics for excursions can be daunting. Another obstacle inhibiting using learning environments outside campus is the structure of the programme. The courses follow one after another in a fixed structure, which makes collaboration between courses difficult since courses may not intrude on the weeks of other courses.

Nonetheless, teacher educators at different departments within the programme have had successful collaborations across courses. Educators in Social Sciences and Natural Sciences joined forces in their individual courses, creating

interdisciplinary projects with students in specific locations of historical, geographical, and biological interest. Another example is a student task conducted in 2020, focusing on the observation and documentation of students' outdoor learning environments in schools and beyond. In addition to this, smaller assignments and units are carried out in various courses, such as outdoor maths, visits to the theatre or interdisciplinary thematic planning in language and literature courses.

Although the structure of the teacher education programme at Uppsala University generally does not allow for the integrated organisation of out-of-classroom learning environment projects, evidently, there are occasional activities in individual courses and sometimes across courses. The syllabus for the primary teaching programme addresses a deep knowledge and a high level of critical thinking on decision-making of methods as well as teaching content, grounded in research and assessed practices. Skills and knowledge address the professionalism of teachers, classroom management, equality, sustainable development, and leadership in the development of the school. In the examples mentioned above, opportunities to reflect on an out-of-classroom learning environment for students exist. Like the other universities, the thesis topic is generated by the pre-service teachers themselves, so it is possible, but it has been rare to see a thesis that addresses out-of-classroom learning environments.

Tallinn University

Learning environments are not explicitly stated in the university's governing documents of the primary teachers' programme. However, there are many examples of using out-of-school learning environments on the course level. A concrete example of a museum-university partnership is the museum practicum at the Estonian Maritime Museum. For the past six years, first-year pre-service primary teachers have taught their first practical lessons in the museum. It is noteworthy that the description of the course does not distinctly mention that a significant part of the course is held in a museum environment. Museum practice begins with creating awareness through a seminar about learning environments, includes observing 3rd grade students at school, planning and implementing learning activities for them at the museum, and ends with group-based and individual reflection after the visit. A museum educator is in the role of a teacher educator or a mentor during this course and supports pre-service teachers throughout the activities. This intense practicum has received very positive feedback from pre-service teachers; they have said that museum practice has helped them to grow as a team with their coursemates and has confirmed to them that they indeed have chosen the right profession. Such

positive emotions are extremely important because pre-service teachers tend to report more negative than positive emotions during their studies, and positive emotions support creative problem-solving among future teachers (Timošćuk & Ugaste, 2012). Moreover, reflecting on empowering situations has been suggested to help integrate practical and theoretical knowledge (Allas et al., 2020).

Other courses also support using various learning environments. For example, during the 'Basic Teaching Practice', pre-service teachers are expected to teach in a chosen out-of-classroom learning environment, too, besides planning and executing regular lessons. This task is often realised as an outdoor science lesson since didactic courses in science introduce and practice methods for outdoor learning and problem- and project-based learning. Another practical task that pre-service teachers are expected to carry out with students is subject-integrated learning, and some pre-service teachers conduct such learning activities across learning environments using libraries, cafeterias, school nurses' offices, and similar. There is also a vocational course, *Experiential Learning in Open Learning Environment*, in which participants design learning activities for museum environments in iterative and reflective cycles. Again, the museum educator is partnering as a mentor for pre-service teachers during this course. Also, every year, several pre-service teachers have chosen to write their master's thesis on a topic related to field trips, outdoor learning, or out-of-classroom learning environments in general.

Discussion

Practising teaching in different learning environments

Experience is the first step in bridging the theory-practice divide. Nothing can replace the experience of actually visiting novel places to familiarise pre-service teachers with learning in environments such as museums. Being in a novel environment, experiencing its possibilities, and orienting oneself to the space are crucial features in learning to teach there (Hamilton & Margot, 2020). In fact, even experienced in-service teachers struggle to use the full potential of the out-of-classroom environments' physical features (Uppin & Timošćuk, 2022). We found that all three analysed national curricula use supportive language when talking about using diverse learning environments. They also leave great autonomy and flexibility in details for the teachers to decide. The specific suggestions regarding learning environments are often tied to specific outcomes, such as learning forest plants or exploring artefacts from the Middle Ages, whereas the more ambiguous language is used to refer to the

wider benefits of learning in different environments (e.g., developing general competences).

Moreover, the unspecific language about or lack of attention to using out-of-school learning environments is common for both the national curricula and the primary teachers' curricula. This might indicate either that the collective understanding of the 'real school' (Tyack & Tobin, 1994) revolves so strongly around the school as a building that learning environments are seen as irrelevant or that using out-of-school learning environments in our countries is so 'natural' that it does not need to be stressed in written form. Or it may indicate both because teachers' mindsets towards using out-of-classroom learning environments are diverse (Kisiel, 2005) and influenced by school culture (Uppin & Timoštšuk, 2019), which in turn also differ. Future research could shed some light on the use of different learning environments because there is no large-scale comparable quantitative data from our regions on the extent of out-of-classroom learning in primary education and related contextual factors.

Practising teaching in schools has always been a core component in teacher education, but teaching in out-of-school and out-of-university settings is not so self-evident. This is illustrated by the fact that learning environments that are not school or university are rarely mentioned in course programmes. Practical tasks in out-of-school learning environments in our universities are generally accompanied by some didactic knowledge about certain domains, but the pedagogical knowledge about field trips and learning in novel places, in general, seems to be dispersed over different courses. It is also not sure whether the specifics of primary teachers' work are considered when subject didactics are designing tasks for pre-service primary teachers for out-of-school learning environments. For example, it is worth considering how or why a field trip to a botanical garden might differ when it is organised by a primary teacher versus by a biology teacher. As a wider conclusion, teaching in out-of-university and out-of-school environments is regularly practised but seldom specified in our universities' primary education programmes. Moreover, the use of different learning environments during primary teachers' preparation is rarely critically reflected upon.

Practising teaching in novel environments without reflection has limited benefits. Supporting the reflection skills of pre-service teachers and teacher educators in a way that facilitates the perceived value of reflection (see Kahn et al., 2014) and meaningful incorporation of new pedagogical knowledge about learning in different learning environments is vital. Whereas reflection, in general, is an important and over-arching part of primary teacher education in our countries, there seems to be room for improvement when it comes to reflective

discussions on the specific benefits of out-of-classroom learning environments on children's and young people's development. Thus, even if teachers have received information about how to teach in out-of-school settings and they have even practised it, they might not be sure why they should invest their time in it in their future practice. The question of 'why' becomes especially important when considering that teachers tend to rely on and model their own previous schooling experiences (Britzman, 2007) and beliefs about what a 'real school' is (Tyack & Tobin, 1994). Pre-service teachers need to develop a sense of autonomy and professional-pedagogical thinking in order to reconsider their own practices (and previous experiences as students) and scrutinise personal biases (Kansanen, 1991).

The international project that brought us together enabled us to reflect deeply on *why* we teach *where* we teach and also improved our self-analysis as teacher educators. By critically reflecting on our views (Šarić & Šteh, 2017) of the learning environments, we, as teacher educators, began to create a space for reflection for pre-service teachers as well to spell out, reconsider and reconstruct their preconceptions on the topic. Moreover, several learning resources (video lectures and a handbook) were created to support pre-service teachers' curiosity, exploration, and inquiry into out-of-classroom learning environments.

One of the unexpected outcomes of our joint project might have been the realisation that the same mindset that supports teachers in museums or in the wilderness seems applicable when teaching digitally. Recently, the Covid-19 pandemic increased teaching digitally, and field trips were hindered for two years. However, it has been observed that students are often given more autonomy during museum learning activities (Uppin & Timoštšuk, 2022) and during digital distance learning tasks (Erss et al., 2021) compared to regular classroom lessons. In this sense, developing an open mindset towards teaching in different settings in pre-service teachers allows them to support student autonomy and prepares them to teach across different learning environments (including digital) and in unexpected situations.

Incorporating out-of-university and out-of-school learning activities into the university curriculum

Within the relatively broad descriptions of our course programmes, teacher educators are quite free to choose activities, methods, and learning environments during their courses. However, in our experience, specific and innovative collaborations between museums and universities tend to depend on the relations of a limited number of educators and are vaguely (if at all)

described in the programme descriptions. On one hand, this gives educators greater flexibility. On the other hand, the opaqueness of the collaborative practices can make them fragile and unsustainable because they depend too much on the efforts of a few dedicated staff members. Although long-term collaborative practices do exist and are highly regarded by both pre-service teachers and teacher educators, in our cases, collaborative practices in out-of-university and out-of-school environments were not explicitly mentioned in course programmes. This makes us ask whether using specific learning environments should be stated in curricula to ensure the sustainability of such learning experiences for pre-service teachers and simultaneously ensure that, in the course of such documentation, flexibility in details remains.

Collaborating and networking across institutional boundaries

It is important to involve and engage individuals in boundary-crossing collaborations: pre-service and in-service teachers, educators from out-of-school institutions of science and culture (whom we refer to as museum educators) and teacher educators alike. The collaboration between schoolteachers and museum educators requires pedagogical knowledge, resources, and a balance between the different roles of the collaborators (Vesterinen et al., 2017). In addition, institutions such as museums and schools often have diverging ideas about teachers' roles in out-of-school learning environments (Seligmann, 2014). A helpful factor has been that our partners in museums also work part-time at the university (in the cases of Sweden and Estonia).

Collaborating with out-of-school partners provides authentic learning experiences for the students (Vesterinen et al., 2017). Even though no specific attention has been thus far placed on inter-pedagogical collaborations between schoolteachers and museum educators in the primary teachers' curricula, primary teachers are still expected to collaborate with educators from out-of-school institutions in their future practice. Thus, we suggest that the possibilities and complexities of such boundary-crossing collaboration should be explored and networks be created in pre-service teacher training. It should be considered, though, that meaningful learning requires participation in a community of practice (Lave & Wenger, 1991). Thus, expecting pre-service primary teachers to collaborate with not only in-service teachers from schools but also educators from other institutions during their practical tasks is challenging because pre-service teachers might not feel that they are part of any teaching community or community of practice yet (Timoššuk & Ugaste, 2010). Moreover, practical tasks at school are already a boundary zone for pre-service teachers (Ruus &

Timoštšuk, 2014), and not all schools may be fully developed organisations for collaborative learning in which experienced and newly qualified teachers work together as pedagogical partners (Slabina & Aava, 2019).

Field trips in teacher training make pre-service teachers' practical tasks complex because at least three different contexts are involved: the university, the school, and the 'other place'. For example, in the Estonian Maritime Museum example, the most complicated part of organising the activities has been establishing clear communication with schools. Even if the organisational information reaches the school leader, it is problematic to communicate the message to the level of in-service teachers who are mentoring pre-service teachers and whose students are coming to the museum. In contrast, we documented museum educators successfully mentoring pre-service teachers during university courses, but we have not collected systematic data about whether these personal connections are sustained in primary teachers' future practice.

Moreover, sustaining meaningful out-of-university learning opportunities in pre-service teacher training is difficult and requires boundary-crossing collaboration between numerous professionals from different organisations (Maloney & Hill, 2016). Previous research suggests that time, accountability (including support from leadership), and funding should be invested by all parties to make partnerships between, for example, museums and universities sustainable (Maloney & Hill, 2016; Stetson & Stroud, 2014). However, since teacher educators are quite autonomous in their work and most collaborations, we detected that our universities' curricula are not explicitly detailed in course descriptions, and they are rarely communicated inside the university to the leadership level.

Furthermore, it is quite difficult to measure or compare the funding or time invested by different organisations: there are no concrete contracts in place, and there are major differences in the ways that university staff members and educators from partnering organisations organise their work. In the Swedish and Estonian cases of collaborating with museums, the same museum professionals have organised the collaborations for many years, which has sustained the connection and helped to enhance and continue good practices. However, there is a risk that when these dedicated people change positions, the collaboration will cease to exist. This is especially so when the need to use chosen out-of-classroom learning environments is not clearly expressed in the written curriculum nor collectively reflected upon and when the management levels of participating organisations are not involved or informed of the collaborative practices.

However, acknowledging the boundary-crossing complexities of organising practical tasks in out-of-school and out-of-university environments should not intimidate teacher educators. Instead, it informs us to consciously

try to clearly communicate the need for learning across institutional boundaries and find ways to collaboratively reflect the learning taking place in these situations, including the learning of the teacher educators themselves.

Conclusion

We set out to explore how our universities support the use of out-of-university and out-of-school learning environments in the teacher training of future primary teachers. We discovered that our respective national curricula for primary schools and teacher training programmes are already relatively supportive but also unspecific about teaching in diverse settings. For example, pre-service primary teachers are expected to learn and practise teaching in out-of-school environments during different courses, mostly as a way to support the development of students' skills or to make learning more authentic and methodologically rich. Nevertheless, the boundary-crossing nature and complexities of encounters with other educators, especially those from out-of-school environments, are rarely reflected upon during those courses. We identified three main suggestions to other teacher educators: 1) incorporate meaningful and reflective practical tasks in museums for pre-service teachers' curricula, 2) ensure sustainability of university partnerships by stating collaborative practices with other institutions such as museums or science centres in written form while leaving enough flexibility in detail for teacher educators and 3) reflect on networking across the boundaries of institutions.

A significant outcome for our universities was a deeper understanding of the possibilities and challenges connected to learning in diverse settings. We uncovered many good examples of out-of-university learning when comparing our experiences. We also recognised the need to emphasise and reflect upon new ways to use diverse learning environments in the future. The current case study has drawn evidence from documents and case notes, and thus, the results are limited by our experiences as teacher educators, written records, and our interpretations of this evidence. Future research and pre-service teacher training in our universities would probably benefit from taking a deeper look at how such collaborations form and how to make them flexible and sustainable. Also, our universities have not systematically researched the attitudes of lecturers or school-based mentors of pre-service teachers towards using out-of-classroom learning environments. Moreover, ways to include pre-service teachers more in building networks and partnerships across institutional boundaries could be explored in greater detail.

Learning in different environments with meaningful tasks supports students' learning, but designing and implementing such tasks requires specific

awareness, knowledge, and skills from teachers. We acknowledge the fact that the development of university course programmes is a long and arduous process, and learning across different environments is just one of many topics that need attention in teacher programmes. Regardless of the limitations of time and financial resources and large student groups, we urge teacher educators to equip future primary teachers with pedagogical knowledge, awareness, and positive experiences and provide sufficient time for reflection concerning teaching and learning in out-of-school environments.

Data availability statement

Teacher educators from three universities collaborated during an Erasmus+ project, Developing Primary Teacher Education Research (DePTER). The data that support the findings of this study are openly available on the project webpage (<https://www.edu.uu.se/collaboration/depter/>).

Disclosure statement

The authors report no competing interests.

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