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REPORT

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Does sustainability really start with teachers? Reflections on integrating environmental education in pre-service teacher education in Namibia and Finland

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ABSTRACT



In this paper, we explore some of the challenges and opportunities of integrating environmental education in pre-service teacher education in Sub-Saharan Africa and the Arctic. Case examples from teacher education programs in Namibia and Finland set the scene for a critical analysis of environmental education in teacher training from these two distinct contexts. We begin with an overview of the current situation of environmental education in pre-service teacher education in Namibia and Finland, followed by a reflection on the courses we have developed at our respective higher education institutions. In response to the urgency of education to attend to the escalating climate crisis, through lessons learned from our environmental education courses and our collaboration on co-designing teacher education, we explore whether sustainability really does start with teachers.

KEYWORDS

Collaboration;
environmental education;
place-responsive;
pre-service teacher
education; sustainability

Introduction

The importance of education in fostering sustainable futures has been emphasized, yet the escalating climate crisis in contrast to the slow developments in education is a cause for concern (Reid et al., 2021). The field of environmental education (EE)¹ faces many challenges, including the precarity of relying on sustainable development as a guiding principle, widely criticized for pushing a Eurocentric and neoliberal business-as-usual agenda (e.g., Stratford & Wals, 2020) that rationalizes the instrumentalization of nature and animals (Policarpo et al., 2018). With growing ecoanxiety (Hickman et al., 2021) there has been increased focus on finding creative ways to engage children and young people in climate education (Rautio et al., 2022; Rousell & Cutter-Mackenzie-Knowles, 2020; Tammi et al., 2020). In addition, limited Global North–South dialogue and collaboration and better understanding on how sustainability is intertwined with other pressing issues such as poverty and inequality, access to healthcare, and food scarcity remains a challenge (Lotz-Sisitka & Lupele, 2017). While understanding that EE takes place in various forms and settings beyond the formal education system (Reid et al., 2021, p. 788), here our focus is on pre-service teacher education, given that globally a considerable number of teachers feel unprepared to teach sustainability content (United Nations Educational Scientific and Cultural Organization [UNESCO] & Education International [EI], 2021). Teachers can be seen as frontline actors who are required to interpret policy recommendations, often with little formal training in navigating the broad field of EE. However, the pressure for teachers to understand and implement climate and sustainability content will likely increase as the climate crisis intensifies. Thus, a greater focus on teacher education and teacher preparedness in EE research is needed.

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Outlining a vision for education for 2050, The Futures of Education Report (UNESCO & International Commission on the Futures of Education [ICFE], 2021) highlights the need for curricula to “fundamentally reorient the place of humans in the world” (p. 77) and for us to learn to live “*with the living planet*” (UNESCO & ICFE, 2021, p. 112; see also UNESCO & Common Worlds Research Collective, 2020). The report explains the need to rethink teacher education (UNESCO & ICFE, 2021, p. 85) and to broaden educational collaborations to create new possibilities and spaces “for learning and innovation” (UNESCO & ICFE, 2021, p. 86). We argue that these spaces for teaching and learning ought to be inclusive of diverse local knowledges and inclusive of taking into consideration the wellbeing and flourishing of other species, not only humans. This article aligns with the concerns laid out in the Futures of Education Report and acknowledges that while there is no one-size-fits-all approach to EE to attend to the complexity of situated challenges we face (Russell, 2019; Saari, 2021; UNESCO & EI, 2021), fruitful possibilities lie in critical dialogue and collaboration across diverse contexts.

In this article we use the prompt “sustainability starts with teachers”² to critically explore whether sustainability really does start with teachers, whether it needs to, and what would need to happen for it to be so. We use case examples from Finnish and Namibian initiatives to include environmental education in pre-service teacher education as a starting point for analysis. This comparative analysis of EE in pre-service teacher training emerges from a collaborative project on codesigning teacher education between a Finnish and a Namibian university as part of a global education initiative. The project is part of a broader Global Innovation in Teaching and Learning initiative funded by the Finnish Ministry of Education, which aims to build research-based collaboration between Finnish higher education institutions and partner institutions in Africa, China, and India to co-create solutions in education that address local needs. Running between 2021 and 2024, the project tackles diverse global learning crises in teacher education. Sixteen researchers and lecturers from Finland and Namibia (five from Finland and eleven from Namibia) and three research assistants (Master’s students) collaborate in the project. The project is divided into three thematic groups: (1) environmental education and sustainability, (2) early childhood education and play pedagogy and (3) school-based studies (SBS) supervision and mentoring. The Namibian team are from the Early Childhood Education and Care (ECEC) department while the Finnish team come from various units of the education faculty, including ECEC, education and globalization and environmental education. The thematic groups work independently on their focus areas and all researchers collaborate on a broader study on building sustainable and meaningful international partnerships in teacher education. The project includes annual visits to/from Namibia and Finland as a form of faculty exchange as well as a student exchange for twelve students, six from each higher education institution. These visits include group work, stakeholder meetings (with decision-makers, university delegates and nongovernmental organizations), school and other site visits, as well as conference presentations.

The three authors comprise the environmental education and sustainability thematic group and collaborate on developing environmental education through the co-creation of teaching resources, course content and research. The two courses discussed in this article were developed independently by the Finnish and Namibian teacher educators prior to the beginning of our collaborative project. The courses from each institution have been evaluated together through critical discussions on effective environmental education, the challenges, and opportunities we have each encountered on our educational journeys, and how we see moving forward at our respective HEIs independently and through collaboration, and what we see as future trajectories of EE in general. These are presented here as a descriptive comparative analysis.

Our collaborative project aims to help integrate sustainability as a cross-cutting curricular theme through the co-development of teaching materials. We have created teaching resources on environmental learning and outdoor education in Finland and Namibia in collaboration with environmental education experts in each country. Demonstrating diverse settings where learning can happen, including Arctic snowy forests and Namibian desert dunes, as well as more urban settings, the teaching resources with demonstrative videos will be used to strengthen teacher education in our respective HEIs through examples of inquiry-based and experiential learning. Building collaborative partnerships across and beyond HEIs has offered a broadened perspective of what innovative learning can look like and where it can happen.

We begin with an overview of EE in Namibia and Finland, followed by an analysis of the pre-service teacher education courses we have designed at our respective higher education institutions (HEIs). What follows is a discussion of some of the challenges and opportunities of implementing EE in pre-service teacher education across the Global North-South we have identified and conclude with suggestions for possible pathways forward in further developing EE in pre-service teacher education and in building stronger, more diverse, “ecologies of knowledge” (UNESCO & ICFE, 2021, p. 126).

Environmental education in Namibia and Finland: An overview

The importance of environmental sustainability education continues to be highlighted across global, regional, and national levels (European Commission, 2021; Finnish National Agency for Education [FNAE], 2014; Namibia Ministry of Forestry, Environment and Tourism [NMFET], 2019; UNESCO & ECFE, 2021). Finland and Namibia experience the impacts of climate change in distinct ways. Namibia is the driest country in the south of Sub-Saharan Africa, where the environment is semi-arid, and rainfall is scarce. Intensifying drought is a challenge for a country where the population relies heavily on land for a living (Garrard et al., 2017). In Finland, effects are not yet as harshly felt, although decreasing snowfall, increased precipitation, as well as increased heat waves and risk of wildfires in the summer months, indicate that Finland’s climate is changing too.

Environmental education and SD a national educational priority in Namibia

After the independence of Namibia in 1990 the education system went through a major transformation and made a significant shift from teacher-centered education to learner-centered education, with the aim of providing a platform for developing sensory skills that are necessary for learning *with/about/of* the environment. The Namibia Ministry of Education, Arts and Culture (NMEAC, 2016) has foregrounded environmental awareness as one its primary goals, aiming to integrate education for sustainable development (ESD) into the school curriculum as a cross curricular theme. The National Institute for Education Development (NIED) is responsible for the design and development of curricular materials for the education system. Environmental Study is used as the main subject for integrating ESD in early childhood and pre-primary education, covering topics such as living things, water conservation and caring for the environment (NMEAC, 2016).

Namibia’s formal commitment to EE and ESD was first evident in its Constitution, which states that the government shall actively promote and maintain the welfare of the people by adopting policies aimed at maintaining ecosystems, ecological processes and biodiversity and ensuring the sustainable use of “living natural resources” (Republic of Namibia, 1990, p. 46). It informed the development of the country’s long- and short-term plans, such as Vision 2030 and National Development Plans, which embrace the idea of SD. Most policies and programs in Namibia have been influenced by these national strategic frameworks, and all government sectors are therefore required to integrate the principles of SD into policy and practice (NMFET, 2019). Namibia is the first South African Development Country (SADC) to have a stand-alone national EE/ESD policy that was launched in 2020, seeking to mainstream environmental issues in education to enhance environmental literacy. However, despite the emphasis of sustainability at the policy level, pre- and in-service teachers still struggle with implementing EE, signaling the need for more training on how to integrate the themes into their teaching and make content more relevant to learners’ everyday lives (Poulton-Busler et al., 2023). Others too have noted how in many African schools and communities “it is necessary to conceptualise what ESD means at the interface of poverty, environmental degradation and health conditions” (Lotz-Sisitka & Lupele, 2017, p. 8).

Sustainability in the Finnish core curriculum for basic education

In Finland, sustainability and SD are extensively referenced in the National Core Curriculum for Basic Education (FNAE, 2014; Mykrä, 2021, 2023; Wolff et al., 2017). However, their prevalence in curriculum

documents does not necessarily translate into its inclusion in teaching practices across different levels of education. The curriculum states that schools should offer strong preconditions for, and play a key role in, guiding students toward sustainable futures (FNAE, 2014). The current curriculum, drafted by the FNAE with input from various stakeholders, was approved by the parliament in 2014, coming into effect in 2016. While the core curriculum offers a guiding framework for teaching, there is flexibility through which municipalities and schools can adapt the curriculum (Lähdemäki, 2019). Despite extensive references to sustainability and sustainable development, the curriculum in its current format is seen to be inconsistent in its use of concepts, failing to offer concise conceptual tools to navigate sustainability content (Mykrä, 2021), reflective of broader critique on definitional haziness of SD as a guiding conceptual tool for EE (Malone & Truong, 2017; Saari, 2021; Selby & Kagawa, 2010). Mykrä (2023) in her in-depth analysis of the Finnish core curriculum has argued that the curriculum is “neither consistent nor coherent when talking about ecological sustainability” (p. 94).

In Finland, EE content is offered in teacher education to varying degrees across HEIs, but EE courses are also offered by other actors outside the formal education system. However, despite Finnish educational policies and guidelines foregrounding sustainability education, “sustainability undeniably plays a minor role in the education of Finnish teachers” (Wolff et al., 2017, p. 5) and teachers are unprepared to teach sustainability content. Finland, a country famed for its excellent education system, can be seen to fall short in terms of EE and sustainability education and an analysis of Finnish teacher education has found that “Finnish teacher education policy does not live up to UNESCO’s quest for transformative sustainability education” (Wolff et al., 2022, p. 15).

Integrating environmental sustainability education in pre-service teacher education in Namibia and Finland

In this section we dive deeper into the two case examples of pre-service teacher training initiatives in Namibia and Finland. Here we describe the EE courses we have created in our respective HEIs and analyze some of the challenges and successes we have encountered along the way.

Lessons from Namibia: EE throughout the lifespan of teacher education

In 2023 a new transformed curriculum was introduced at the University of Namibia, in which a few changes were made to the EE courses. One reason behind revising the EE curriculum was to align the courses with governmental policies. After comprehensive groundwork was carried out by a group of environmentally minded ECEC lecturers who advocated for the importance of integrating environmental issues into the curriculum, new EE modules were introduced in 2023 (see [Appendix A](#)). A core curricular six-week course “Environmental Education for Sustainability” was launched and is compulsory for all students, introducing students to the SDGs. In addition, EE modules are taught in each year of the three-year ECEC teacher education program, gradually building on foundational knowledge and diving deeper into specific topics. Across the EE modules, all thematic units are aligned with SDGs.

The EE curriculum is aligned with the three themes in the national core curriculum. The aim is to bridge theory and practice and link course content with the SDGs. Through inquiry-based learning students develop lesson plans and projects accompanied with teaching aids made from recycled materials that they can use in their future teaching work and school-based studies. Framing the courses through education for sustainable development (ESD), students explore the history of SD and ESD and the three pillars of sustainability. The course also explores national and global policies related to EE and ESD, including the national curriculum. Diverse theories of EE and ESD are explored. Understanding the impacts of human activities on their surroundings and the environment, as well as risks of poor resource use and waste management are studied. Overall, the aim is to gain an understanding on how sustainability can be integrated into teaching as a cross-curricular issue, across subjects and grades. The teaching strategies range from experiments to explore climate change phenomena, creative methods such as creating teaching tools (songs, poems) and project-based activities on health, safety, and nutrition, equipping students with skills and knowledge on how to introduce these topics in schools in engaging ways.

Professional development of teacher educators

Professional development initiatives have been created to address several common perceptions of the challenges in integrating ESD in Namibian formal schooling, supporting teacher educators in the competencies needed to address ESD content in the curriculum and developing resources to support ESD implementation (Poulton-Busler et al., 2023). Finding avenues for creating teaching resources and alternative learning spaces beyond the classroom (e.g., afternoon clubs, field trips, tree planting) and designing different initiatives to raise awareness of ESD has been an important step in developing curricular content. To respond to the lack of teaching resources, UNAM university's environmental education teacher educators took part in a professional development course "Sustainability Starts with Teachers" organized by UNESCO and Rhodes University. Three teacher educators carried out a Change Project focusing on environmental education. As part of the project, they designed a toolkit of teaching aids from recycled materials and further developed them with pre-service teacher trainees to involve them from the onset in designing their own teaching materials. Findings were shared across the department and ultimately the creation of recycled teaching aids became a compulsory assessment criterion for students when out on School Based Studies (SBS).

One example of teaching aids is the Big Book Project where language lecturers create short storybooks made from recycled materials. The books are used in schools to demonstrate how books can be created, especially useful for when books are not already readily available. Storytelling is used to foster the habit for reading as part of community projects. The Big Book Project serves as an example of interdisciplinary collaboration, as art lecturers assisted in the design and crafting of the books. Other examples of using recycled materials include creating face masks and puppets that serve as useful teaching aids in many subject areas. In addition, an initiative was carried out on campus, in which a tree was planted for each management member as well as for the different departments of the faculty. A tree was also planted for each subject in the ECE Department to raise awareness on the importance of a clean environment. The resulting garden serves as a conducive teaching space, taking learning outside of the classroom. The outdoor space has potential to be further developed and used more extensively as an outdoor learning space. It was noted that these sustainability activities brought the unit closer to work together, as regular briefs are held to make sure that content is not unnecessarily repeated in other courses through streamlining of course content and teaching topics in an integrated manner across the curriculum. It is done through critical inquiry and art-based learning and experiential learning.

As a result of the initiative, the teacher educators reported a stronger ESD community across departments and improved cleanliness and greening of the campus, successful awareness raising and development of teaching resources from recycled materials that also saves teacher trainees in teaching material costs, integration of creating teaching aids from recycled materials as an assessment criterion, as well as creating a database of teaching aids (Poulton-Busler et al., 2023). Despite the success of the capacity building "Change" project, work remains in creating more awareness on the importance of a whole-school approach to teaching sustainability and the scaling of the project across schools and different campuses (Poulton-Busler et al., 2023). To scale the project-based learning approach in ways that are not too time-consuming for students, the projects could be integrated as cross-curricular projects with joint assessment, immersing students into interdisciplinary learning during their training.

Teacher trainees' reflections

After the courses, feedback is gathered from students through feedback forms. Students have expressed a sense of empowerment and have been able to discern the connection between what they have learned and the curriculum they will be required to teach in schools. After the courses, students have contemplated on seeing the connections between the tree planting activities and climate change, energy saving and water usage, in addition to the daily relief of shade that the trees provide. It has been these hands-on activities of tree planting that have been impactful. It has given insights on how to use water sparingly. Students also reflected on the variety of projects that they can replicate in their own teaching, including through inquiry-based learning and learning through games. Overall, students have said they have a better understanding of what responsible, environmentally friendly, and sustainable choices could look like.

Lessons from Finland: Optionality as an obstacle in institutionalizing EE?

To address the lack of EE in teacher education at the Finnish university, an introductory course on environmental education was created in 2019 and at the time of writing the course is being taught for its fifth consecutive year (see [Appendix B](#)). The course is an optional five credit (ECT) course and open to students from all faculties and is taught each academic year. In 2021 it was selected to be part of the university's Sustainable Development Minor that allows students to choose from a wide range of sustainability-related courses, encouraging interdisciplinary learning. While we believe that a course such as this one should be open to all students, we also believe that having a core component on sustainability and environmental education as a requirement for pre-service teachers is necessary, given that teachers are expected to include sustainability content in their teaching, as outlined in the National Core Curriculum (FNAE, 2014). The original aim of the course was to offer education students an overview of the origins and developments in environmental education research and practice, its policy landscape, and a critical overview of climate justice and sustainability discourse, including multispecies and posthumanist perspectives. As we agree that there is “no one size fits all” approach to addressing complex issues (Russell, 2019), a “toolbox pedagogies approach” (Saari, 2021) exploring diverse pedagogies and approaches was chosen. The six-week course has been taught online through Zoom seminars and a Moodle workspace since the COVID-19 pandemic disrupted on-site teaching after the first year's in-person teaching. Assessment is based on active participation in seminars, completion of activities and a final project that can be completed individually or as group work.

The course aims to increase understanding of the foundations and diverse approaches to environmental education, to understand and be able to apply key concepts to teaching practices and educational planning, as well as to be able to critically examine different frameworks in environmental education and assess their applicability to different teaching contexts. In addition, the course encompasses a critical examination of the socio-political and ethical issues concerning sustainability, including the exploration of climate justice matters from diverse viewpoints, such as how the concerns and welfare of other species could be more adequately considered. Recognizing the interconnectedness between humans, other species, and the ecosystems we share has been emphasized, and the necessity to “rebalance our relationships with the living plane” (e.g., UNESCO & ICFE, 2021, pp. 112–113) has been increasingly acknowledged.

In the course we also explore arts-based pedagogies and creative inquiry as a means of navigating eco-anxiety and different approaches related to environmentally oriented education. To address the diversity of issues related to environmental education a range of educational frameworks are explored, including outdoor education (Vladimirova, 2023), humane education (Saari, 2018, 2021; Weil, 2016), common worlds pedagogies (Taylor & Pacini-Ketchabaw, 2019), ecojustice education (Lupinacci, 2020; Martusewicz et al., 2015) and multispecies or animal-inclusive intersectional EE frameworks (Lloro-Bidart & Banschbach, 2019; Russell, 2019). Through case examples of diverse EE initiatives, different approaches such as phenomena- and problem-based learning are explored. Exploring the foundations and historical trajectory of EE, the course aims to foster critical discussion on the field's possible future trajectories, including through the lenses of participatory youth-led approaches and multispecies perspectives.

Fostering space for critical discussions with students has been a core aim and has indeed been a richness of the course due to the cross-cultural learning experience through having international students from a range of countries across Europe, North and South America, Africa and Australasia. Discussing global issues through the lens of diverse situated perspectives has allowed participants to learn from one another and identify differences and/or similarities in relation to the issue in question in their respective contexts. Students have shared examples of EE programs, policies from distinct contexts, which has shed light on shared challenges in advancing EE in practice. The course has thus far offered a unique setting for cross-cultural sharing of situated perspectives, as we have been lucky to welcome students from different countries across the globe, which adds to the richness of learning.

The most common challenges we identified during the period of teaching the course included a growing eco-anxiety among pre-service teachers, a general disappointment in a lack of EE in their degrees and frustration in the possibilities of including EE in their teaching practice. Positive developments in the five years of offering the course include an increasing number of students interested in the course,

despite the course remaining an optional course. However, students with an existing interest in environmental issues enroll in the course. As a result, final projects are of a high-quality and include a diverse range of topics, as students use it as an opportunity to design practical tools (e.g., lesson plans) for their own future use and application in teaching practices. Many final projects have been lesson or project plans (some with teaching aids included), with a few research case studies focusing on environmental phenomena, such as wildfires and cloud seeding. Several lesson plans have focused on food systems and plant-based diets and their environmental and social impacts through diverse methods, including card games. Another popular focus is trash and recycling and activities have included “trash treasure hunts” and developing art works and teaching aids from recycled materials. Other projects have included an ecojustice education-inspired teaching project on responsible pet ownership through storytelling methods and comparative studies on earthquake awareness education.

Teacher trainees' reflections

After the Finnish course, anonymous feedback forms are filled out by students. Some comments focused on the learning process and what the students learned as compared to what they expected to learn. For instance, students have shared how one of the insights from the course is an understanding on how large the field of EE and how it is much more than knowing about climate change. Other students have highlighted a deepening of their understanding of global environmental problems, resulting in wanting to find ways to make more responsible choices to protect the planet. Appreciation for the international learning community was also reflected in feedback in the ways that knowledge exchange and discussions created awareness on initiatives taken in different countries to protect the environment, and what environmental education courses are offered. Learning more about ecoanxiety and outdoor education was also mentioned. Students have expressed an interest in continuing their learning journey about environmental issues for the purpose of teaching. This has been a recurring issue over the years, as there has been a growing need for continuing education in the form of advanced in-depth EE courses. This has echoed a recurring theme of a prevailing disappointment in the situation of EE in respective countries, dominance of sustainable development in educational policy and the limitations of maintaining a surface-level approach to EE (e.g., focus on recycling) with limited possibilities of integrating critical reflection discussion on the root causes of the climate crisis or topics that are considered more difficult to address.

Discussion: Challenges and opportunities

What might be considered “successful” or “efficient” integration of environmental education in formal pre-service teacher education continues to be a topic of deliberation. Through our collaboration on co-designing teacher education that is responsive to diverse needs of society, we continue to be faced with the question: what does, and should, EE look like in diverse contexts?

The results of the Namibian experience suggested to the Finnish educators the importance of environmental education courses that run throughout the lifespan of the teacher education course. Starting with the basics followed by incremental progression through the various themes related to sustainability with the aim of forming the building blocks for critical thinking that is needed to navigate diverse sustainability challenges (and tools for navigating them in diverse classrooms) is a strength of the Namibian approach. Rather than opting for a deep dive into the depths of complex sustainability challenges, a steady coherent approach that runs alongside other courses offers students opportunities to integrate their EE learning into that of other courses. For at least until the next curriculum revision, EE will continue to be a core part of the teacher education curriculum. The successful formalization of EE modules in Namibia signals the opportunities to institutionalize EE in ways where it could be a more inherent element, a building block through which to gradually immerse learners into the complexities of sustainability throughout the lifespan of teacher education. What remains a question is how to lay fruitful foundations for students who come from different backgrounds and have different levels of knowledge.

Striving to adopt a whole-school approach, a school garden has been created and can be used for teaching. In addition, creating teaching aids that are made from recycled materials has become a compulsory component and criteria in course assessment. It also helps with saving money, given that not everyone has money to buy posters and other materials that might be required for coursework. Conversely, we found in our analysis of our respective course syllabi that the birds-eye view approach used in the Finnish optional EE course offers important benefits. The course runs over a period of only one and half months, which does not allow for a deep immersion into topics, but rather an overview of the broad field that is EE. As the course is open to students from across faculties, we do not know whether students have prior knowledge of the field. As a result, some may have a strong background knowledge in EE, while others are entirely new to the field. Navigating between diverse starting points is something that needs to be addressed each year. For this reason, assignments are designed in a way that offer flexibility in terms of complete novices to the field and those who want to dive deeper into specific themes. Overall, one of the main differences between our distinct approaches is that the Namibian courses are more practice-driven, while the Finnish course is more theory-driven, reflecting the broader landscape of education in each country. In Finland, universities have more autonomy to develop their courses, as well as the school system has autonomy on how it implements the core curriculum. In addition, Finnish teacher education has a strong research focus, while in Namibia alignment with the national core curriculum is firmer.

Navigating institutional constraints

Institutional dynamics play a significant role in the development and implementation of EE. Whereas Namibia provides a promising example of the importance of maintaining a thorough focus on EE and sustainability across the lifespan of teacher education, some challenges remain in following up on whether and how these teachers implement EE content in their future schools and understanding what challenges they may face in these institutions. Thus, following up with students once they enter the teaching profession is seen as a future endeavor to continue the development of responsive teacher education. Working more closely with schools can provide valuable information on how teacher educators can better serve teacher trainees during their formation. Contrary to Namibia's close alignment of teacher education curriculum with the national curriculum, Finland lags on institutionalizing EE in teacher education. While currently only an optional course with limited outreach, the teacher education curriculum risks misalignment with the national core curriculum (FNAE, 2014) and its strong sustainability focus. Although the strong alignment with SD and sustainability themes, these remain marginalized in teacher education. Given possible institutional constraints regarding the inclusion of EE modules, alternative ways to infuse teacher education with sustainability themes is needed. Through professional development initiatives such as this, training teacher educators could be one promising solution to ensure a more holistic understanding of climate change, sustainability, and pedagogical opportunities for the integration of themes across curriculum. In efforts to build stronger and broader communities of practice, both intra- and inter-institutional, training initiatives can serve as a fruitful starting point to build communities of practice. It also brings into light the importance of educating teacher educators, particularly in instances where stand-alone EE modules and courses might be difficult to implement. Others too have highlighted the importance of educating teacher educators (Wolff et al., 2017). Thus, we find validity in questioning whether teacher educators should have professional development and competency building in EE and sustainability so that sustainability issues could be addressed across different courses.

Navigating global-local understandings of sustainability

Exploring the contextual contrasts between Finland and Namibia, our collaborative effort across the Global North and South illuminated divergent interpretations of “sustainability” and “sustainable lifestyles.” We realized that heavy reliance on sustainable development and sustainability discourse influences the trajectory of environmental education course content. Although we acknowledge concerns about excessive focus on sustainable development, we see the need for further research on how this terminology is understood and how it may change (McKenzie et al., 2015). Despite different starting points, through

our critical reflections on integrating EE in teacher education, the importance of situated place-based/place-responsive approaches became evident. Challenges in how to live with a changing environment has been a constant in Namibia and thus learning from Namibian local knowledge can enrich environmental education by offering insights into coping with changing environments, fostering alternative relationships with nature. Learning from the past can bring important insights on how to navigate present challenges. In Namibia's diverse regions, embracing local cultural groups and their knowledge, rather than solely relying on institutional "experts," can yield valuable insights. For instance, learning from how communities manage human-wildlife conflicts can inform strategies to address current challenges, like those between human and elephant populations coping with drought-related hardships. The idea of place-based and place-responsive formation of knowledge is crucial for shaping sustainable lifestyles through a situated approach. Place-based education involves community-driven efforts to address local challenges, integrating hands-on learning experiences into various subjects (Smith, 2002; Sobel, 2004). For instance, students may undertake projects like water-saving initiatives, researching and promoting water conservation methods within their district.

Unlike place-based education that concentrates on the cognitive development of students as well as enhancement of the community, a place-responsive approach has more subtle connotations. A place-responsive approach recognizes place as a living entity, emphasizing humans as one part of a broader community that includes both human and non-human entities. It prioritizes understanding and responding to the interconnected ecologies within a place (Lynch & Mannion, 2016; Somerville, 2010; Stevenson et al., 2018; Stewart, 2004; Vladimirova, 2023). Place-responsive approaches can open opportunities of learning to listen to and notice "diverse language systems like weather, climate, water, soils, birds, insects, fungi, forests and other mammals and animals" (Lupinacci et al., 2019, p. 6), offering fruitful lessons in learning to live with the planet. Through place-responsive education, students engage deeply with a place, challenging harmful, colonial practices and fostering coexistence with non-human beings. For instance, a project might involve observing hedgehog life to understand their challenges and explore solutions, disrupting human-centered perspectives.

In both educational approaches, local knowledge, including that of Indigenous Peoples, is valuable for exploring sustainable practices. Without romanticizing or flattening Indigenous philosophies (Mincks & Fong, 2023), we argue that local communities may hold wisdom in how to live in/with a place in more sustainable ways (Tom et al., 2019). Therefore, continuous fostering of intergenerational knowledge exchange with a focus on situated perspectives is something we can explore further in our respective contexts, both in Finland and Namibia. In addition, international collaborations can provide important opportunities for learning with and from diverse peoples to better understand contextual and situated perspectives to sustainability.

Have the courses been successful?

How do we know if the courses have been successful? The feedback of the students suggests that the courses have offered students some insights into how to teach EE in the field and this has been the reason why we have designed assignments in ways that help them prepare for future teaching (e.g. lesson plans, teaching aids). In Namibia, the cyclical nature of the training means that some graduates who have entered the teaching profession become mentors for existing students. In Namibia students are also observed in their teaching practicum, offering opportunities to see how they are implementing EE during their teaching placements. Students are shown different ways of implementing EE in the classroom and beyond (e.g. tree planting) and whether they can implement EE in their future schools will depend on many factors beyond their training (e.g. school resources, administrative support). In Namibia, a growing number of students are choosing EE and sustainability as the topic of their project-based learning projects in the third year and in research projects in the fourth year of their studies, which is a sign of increased interest in EE. While in Finland, we lack evidence regarding whether students continue to practice EE once they enter the field, given that our students come from various countries and stages of their studies. However, a continued interest in the course and indications from students on the need for an in-depth course hint at the importance of the course. In addition, the high quality and diversity of topics covered

in final projects and the depth of reflection in course assignments demonstrate a high level of engagement and critical thinking from students. In addition, an increasing number of students are choosing EE as the topic of their master's thesis, and there is growing interest among students in pursuing internships related to EE (e.g., in forest schools). Nevertheless, longitudinal feedback would be needed to account for the course.

Concluding remarks: Does sustainability really start with teachers?

Despite the differences in whether to use SD as a guiding principle and our respective courses being either more practice- or theory-driven we have found synergies in how to complement and strengthen each other's expertise through our collaborative work. The importance of a sustainable trajectory for EE in teacher education across the lifespan of teacher training and how to motivate student teachers, teacher trainers and our broader institutions to foster such continuity remains a source of deliberation.

Returning to the question, does sustainability really start with teachers, we see sustainability as a broader challenge that ought to be shared beyond the classroom walls, including through community engagement and a whole-school approach. Is it realistic to expect sustainability to *start* with teachers? If "teacher" is viewed through the conventional sense, what tools, resources, training, and other support would in- and pre-service teachers need to integrate EE themes into their teaching? Our collaborative project has shown that moving forward with EE transformations lies in critical discussions and reflective co-design of pedagogies, rather than approaching EE through an idea of ready-made transferability and applicability of pedagogical approaches. Further emphasis on Global North-South collaboration is integral to working toward holistic educational transformations and avoiding the pitfalls of universalized frameworks that may run the risk of flattening complex challenges and possible solutions. Significant contextual differences affect how learning in and with the environment can happen, highlighting the importance of place-based and place-responsive approaches to educational transformations. We also see it as a promising opening for unpacking concepts, such as sustainability, that risk remaining abstract without contextual analysis.

Our collaboration has uncovered new perspectives to our understandings of sustainability and how we might design our teaching in ways that it is more inclusive of diverse perspectives. Through co-creating of two work packages in collaboration with EE experts in each country we aim to integrate this content into our courses and seek further avenues for future collaboration. Thinking more broadly about the future of EE, through our collective inquiry on integrating environmental education in pre-service teacher education, we have identified the following as key takeaways:

- Investing in international, cross-cultural, cross-sectoral collaboration.
- Embracing cultural and natural diversity and situated perspectives.
- Incorporating critical environmental learning approaches throughout university curricula.
- Addressing institutional constraints in implementing environmental education courses.
- Investing in faculty professional development and developing teaching resources and competencies.
- Enhancing course evaluation via follow-up surveys and longitudinal studies.
- Promoting critical environmental education, place-based and multispecies approaches.
- Providing students with opportunities to develop teaching resources.

Returning to the question, does sustainability really start with teachers, we consider it a complex issue. While teachers undoubtedly play a vital role in teaching for sustainability, they require adequate support, resources, and training. This necessitates that educational administrators and policymakers establish the essential prerequisites to help teachers effectively integrate sustainability education into teaching. In addition, learning for sustainability should extend well beyond the university education and classrooms across sectors and disciplines by building diverse communities of learning. Therefore, teachers are an important factor in a broader community of practice, and sustainability can begin with them, but with the comprehensive support and groundwork of a diverse range of actors in building this community.

Notes

1. In this article, we use EE as an overarching term to refer to the vast field of EE with its various approaches (e.g., education for sustainable development, education for sustainability, climate change education), while understanding the limitations of such umbrella terms and the intricacies between these approaches.
2. This prompt is inspired by the ‘Sustainability Starts with Teachers’ training programme organised by Rhodes University’s Environmental Learning Research Centre and UNESCO.

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Appendix A – Namibian courses

Environmental education for sustainability I

The purpose of this module is to equip students with understanding, skills, dispositions, theoretical understanding, practical dimensions, values, and competencies regarding teaching of cross-curricular themes in the Junior Primary phase. Students will be able to discuss themes in the Environmental Education school syllabus and apply them to the Sustainable Development Goals (SDGs). On completing the module, students should be able to:

- Define and explain concepts related to environmental awareness and sustainable development.
- Explain the purpose of Environmental Studies as a subject in the Junior Primary phase.
- Define key concepts related to thematic teaching and integration.
- Discuss the importance of environmental awareness in Early Childhood phase.
- Interpret the SDGs (17 goals) in relation to the Environmental Studies school curriculum.
- Analyze the Environmental Studies school syllabus and apply teacher education content.
- of the strategies for teaching Education for Sustainable Development.
- Create teaching aids from recycled materials.
- Plan and present Environmental Education lessons and peer-assess.

Education for sustainable development

The purpose of this module is to enhance students' in-depth analysis and application of SDGs in relation to cross-curricular themes at Junior Primary phase. Pedagogical skills on how to teach Environmental Education for Sustainability at Early Childhood and Junior Primary phase will form an integral part of this module. Students will be able to apply SDGs in cross-curricular theme integration at Early Childhood Education and Junior Primary phases and carry out an environmental change project. On completing the module, students should be able to:

- Explain and interpret SDGs and link them to national goals such as the NDP3, Vision 2030, Harambee Prosperity Plan.
- Analyze the Environmental Education School syllabus themes and sub-themes and link it to the SDGs.
- Apply SDGs in teacher education as well as school curriculum for example, greening and bluing the curriculum.
- Apply skills to include cross-curricular themes and topics of integration at ECE and Junior Primary phases.
- Design materials and teaching aids to teach these learning outcomes in a learner-centred way according to the thematic approach by consulting the ECE and Junior Primary Syllabus for specific grades.
- Present Environmental Education lessons, peer-assess fellow students and write constructive reflections for their portfolio.
- Plan, develop and implement a small-scale sustainable environmental change project appropriate at ECEJP phases.
- Evaluate own and peers' sustainable environmental change project.

Appendix B – Finnish course

Introduction to environmental education 5 ECTS (Finnish HEI, optional course open to students from all faculties)

Objectives and outcomes

Students will:

- Increase their understanding of the foundations and diverse approaches to formal/informal environmental education.
- Understand and be able to apply key concepts to teaching practices, educational planning and/or research.
- Be able to critically examine different educational approaches to environmental education and compare their efficacy to different teaching contexts and age groups.
- Increase their understanding of the socio-political context and ethical issues related to sustainability and education.
- Explore sustainability issues from points of view of various stakeholders and frameworks.
- Explore arts-based and creative pedagogies as a means of navigating eco-anxiety.

Course content

- Foundations and development of environmental education
- Ethical and socio-political issues related to climate change and sustainability.
- Policies related to sustainability and environmental education.
- Exploring sustainability issues from the perspectives of various stakeholders and frameworks, including multispecies perspectives, posthumanism and critical animal studies
- Different pedagogical frameworks, including education for sustainability, outdoor education, humane education, ecojustice education.
- Pedagogical models including project-based learning, service learning, citizen science and place-based learning.
- Case studies of environmental education activities/projects.
- Designing and evaluating environmental education lesson plan or case studies on climate change phenomena.