6.0 Introduction

Sustainability through the lens of education

Bianka Plüschke-Altof and Monika Suškevičs

KEY MESSAGES

- **Higher educational attainment alone does not guarantee more sustainable behaviour.** Comparative studies in the Nordic and Baltic countries show that people's attitudes in Estonia do not lag significantly behind those in neighbouring countries, yet Estonia ranks last in sustainable behaviour. Education increases awareness and builds skills that support sustainable living, but this alone is not sufficient.

- **Sustainable behaviour is shaped by both education and social context.** Studies of environmental awareness in Estonia show that pupils are well informed about sustainability issues, but their participation in sustainable activities remains limited. Individuals with higher education may exert a greater environmental burden by engaging more frequently in activities with a large ecological footprint. Beyond education, sustainable behaviour is influenced by societal values, institutional arrangements and opportunities for action.

- **Education can act as a driver of transformative change.** By teaching knowledge and skills, supporting the emergence of interpretive and amplification communities around sustainability, leading by example, and creating institutional environments for practice, Estonia's education system can contribute to a more sustainable future.

INTRODUCTION

Against the backdrop of accelerating environmental and climate crises, high expectations have been placed on education to develop sustainability competences. But what role does education actually play in shaping sustainable choices? This chapter examines how education influences sustainable development and assesses the current situation in Estonia. The articles address the broader cultivation of sustainable practices (6.1), pupils' sustainable mobility and related opportunities (6.2), climate awareness and climate-responsible behaviour (6.3), and the teaching of sustainability competences (6.4).

Although the concept of sustainability is widely recognised, it may mean different things to different groups at different times.[1] At its most general, it implies prioritising the needs of all life forms and the planet so that human activity does not exceed the Earth's ecological boundaries.[2] There is, however, disagreement over how sustainable development should be pursued in practice. Approaches centred on sustainable development seek to balance social justice, environmental protection and economic development to secure well-being for future generations.[3] By contrast, degrowth perspectives question whether environmental protection and social justice are compatible with continued economic growth and advocate social arrangements in which well-being does not depend on growth.[4] What is clear is that sustainable development requires complex knowledge, significant behavioural change and broader societal transformation.[5]

Education has an essential role in developing sustainability competences.[6] In this context, environmental and climate awareness refer to a scientifically grounded understanding of the reciprocal relationship between humans and the environment, combined with the willingness to take this understanding into account in everyday life.[7] This must be complemented by climate literacy – an understanding of how climate change affects us and how our actions affect the climate.[8] Neither concept is limited to knowledge; both also involve an emotional connection to the surrounding environment. Equally important are value orientations that support environmentally responsible and climate-responsible choices, as well as practical knowledge and skills for acting sustainably and imagining alternative sustainable futures.[9] In the context of climate change, this includes the capacity to reduce one's climate impact and strengthen resilience.[10]

EDUCATION INCREASES ENVIRONMENTAL AND CLIMATE AWARENESS

Education in Estonia has already contributed to raising awareness of environmental and climate issues in society. According to the latest PISA assessment, Estonian pupils rank among the top-performing countries in the world – within the top five – in mathematics, reading literacy and science[11]. At the same time, as Maie Kiisel and Bianka Plüschke-Altof argue in their article, education helps overcome barriers to adopting sustainable lifestyles – for example, by strengthening emotional connectedness to nature and developing self-regulation skills. As Grete Arro, Monika Suškevičs, Veljo Runnel and Asta Tuusti note, sustainability topics are addressed in various ways across both formal and non-formal education in Estonia, particularly through environmental education, which over more than a century developed a network of centres and a wide range of programmes,[12] encompassing formal education in schools and kindergartens as well as non-formal experiential learning. Everyday informal learning also plays a role,[13] supported by television programmes, magazines, nature trails and museum education. Innovative approaches, such as the growing field of citizen science, show promise in shaping participants' scientific worldviews.[14]

While environmental education focuses primarily on nature and ecological issues, education for sustainable development seeks to clarify their links with society and the economy.[15] Examples include the European sustainability competence framework,[16] the Green School programme,[17] and learning materials and methods developed within the ABC of Climate Change initiative.[18] In addition to educating future generations, current employees and leaders are supported through the green skills programme[19] and continuing professional development, contributing to the emergence of interpretive and amplification communities.[20] These themes are further explored in the article by Aet Annist, Piia Post and Jaanus Terasmaa.

THERE IS A GAP BETWEEN AWARENESS AND BEHAVIOUR

Sustainable action, which sustainability competences are intended to support, can be understood in different ways. What they share is the recognition that our behaviour is closely and reciprocally linked to the society and environment around us. As elsewhere in the world, Estonia faces a marked gap between awareness and sustainable practice. Comparative studies

conducted by the ORKLA Group in 2020 and 2022 in the Nordic and Baltic countries indicate that attitudes towards environmental sustainability in Estonia do not lag significantly behind those in neighbouring countries, yet Estonia ranks last among them in terms of behaviour.[21] According to the most recent Eurobarometer survey, respondents in Estonia are also the least likely in the EU to agree that environmental problems affect their daily lives and health.[22] Unintended effects must also be considered. Higher levels of educational attainment may indirectly increase environmental pressure, as more educated individuals are more likely to engage in activities with a larger ecological footprint.

BEHAVIOURAL CHANGES REQUIRE SOCIETAL SUPPORT

A central task for the future is to bridge the gap between awareness and action. Beyond self-reported behaviour, the actual environmental impact of our activities must be assessed critically. Several indicators have been developed to measure this, including the ecological footprint and the ecological rucksack, which help evaluate impact on resource use and the environment more broadly.[23] Moving towards more sustainable behaviour also requires recognising systemic problems and adapting teaching to support transformative learning.[24] Transformative learning means learners reassess and reinterpret existing assumptions and attitudes.[25] According to PISA, Estonian pupils score below the OECD average in proactive learning attitudes, willingness to ask questions and positive engagement with challenging tasks.[26] Their ability to interpret information and apply it to real-life contexts is likewise below the OECD average. Arro and colleagues note that although sustainability themes are included in curricula, research assessing the actual impact of teaching practices remains limited. Sustainability competence is not yet treated as a general or transversal competence, even though its cross-cutting nature calls for such treatment and would enable more varied and systematic teaching across subjects.

Reducing the gap between awareness and behaviour also requires recognising educational institutions as shapers of sustainable practices and creators of enabling environments.[27] Annist and colleagues examine recent developments in climate awareness and climate-responsible practice. The calculation of higher education institutions' carbon footprints and the development of related assessment methods[28] indicate that educational institutions are beginning to assume a leadership role. Sustainability action plans in educational institutions are becoming more common, addressing mobility, waste management and behavioural guidance.

However, educational institutions can promote sustainable practices only with broader societal support. As Poltimäe, Poom, Aasa, Haamer and Nurk observe, when school networks, public transport systems, and family and community mobility habits do not support independent school travel or sustainable modes of transport, the formative role of educational institutions is constrained. The same applies in areas such as waste generation, overconsumption of energy and goods, and environmental protection, where systemic changes in governance, the economy and prevailing conceptions of a good life are as important as education. The central task for the future is to overcome the contradiction between awareness and action.

HOW DO WE MOVE FORWARD?

This chapter raises at least three key questions, explored in the four reflections accompanying the articles.

First, how can we reduce the gap between awareness and sustainable behaviour? In her reflection on the first article, Grete Arro argues that bridging this gap requires a focus on deepening ecological literacy and fostering a stronger emotional connection with nature, so that change is internally motivated rather than driven by external norms. Nature education programmes should therefore encourage attentive engagement with the natural world and appreciation of its diversity. Ecological literacy also involves understanding the properties of complex systems – including cumulative effects and time lags – so that individuals can grasp the long-term consequences of their actions. Equally important is futures thinking, which supports the

capacity to initiate systemic change and consider alternative development pathways. Without these competences, sustainable action may remain difficult to translate into everyday life.

Second, how can society as a whole – and activity across different sectors more broadly – promote sustainable behaviour? In his reflection on the second article, Andero Uusberg argues that society should support simple and appealing sustainable choices. For example, regional and school network planning should ensure that school routes, cycling infrastructure and public transport networks – including service quality – support independent school travel and sustainable mobility. Spatial planning can also create enabling environments – for example, by providing safe links between schools and extracurricular activities and shaping spaces that encourage movement by choice rather than necessity.

Third, what can educational institutions do to promote sustainability? The education system plays a central role in shaping sustainable mindsets. In their reflection on the fourth article, Liisa Puusepp and Mihkel Kangur argue that curricula should create substantive cross-curricular links and enable interdisciplinary teaching that supports systemic thinking. Because developing such understanding takes time, curricula require clear prioritisation and a reassessment of expectations regarding the pace of learning, so that the pupils can develop a systemic understanding of sustainability. Teacher education should place greater emphasis on understanding complex systems, and school leadership should actively support these approaches in practice. In their reflection on the third article, Elina Malleus-Kotšegarov and Kadri Kalle emphasise the role of higher education institutions as value-based leaders and role models in sustainable practice. Universities can function as experimental settings in which sustainable solutions are tested and their impact assessed. They also call for a shift from competition to collaboration in science and higher education to address complex challenges more effectively.

Lasting solutions to complex problems depend on cooperation between practitioners – teachers, school leaders and extracurricular coordinators – and change agents, such as parents, communities, municipalities and entrepreneurs.

REFERENCES

1. G. Bianchi, U. Pisiotis, M. Cabrera, *GreenComp: The European sustainability competence framework* (Publications Office of the European Union, 2022).
2. G. Bianchi, U. Pisiotis, M. Cabrera, *GreenComp: The European sustainability competence framework* (Publications Office of the European Union, 2022); Estonian Ministry of the Environment, Estonian Ministry of Education and Research, *Keskkonnahariduse ja -teadlikkuse tegevuskava 2023–2025* (2023).
3. H. Washington, *Demystifying sustainability: Towards real solutions* (Routledge, 2015); Säästva arengu sõnaseletusi: Säästev areng. – SEI Tallinn, 2024, http://www.seit.ee/sass.
4. M. Schmelzer, A. Vetter, A. Vansintjan, *The future is degrowth. A guide to a world beyond capitalism* (Verso, 2022); see also https://tasaareng.info/materjalid/.
5. G. Bianchi, U. Pisiotis, M. Cabrera, *GreenComp: The European sustainability competence framework* (Publications Office of the European Union, 2022); R. Portus et al., Exploring the environmental value action gap in education research. – *Environmental Education Research* 30 (6), 2024.
6. R. Portus et al., Exploring the environmental value action gap in education research. – *Environmental Education Research* 30 (6), 2024.
7. Turu-uuringute AS, Tallinn University, *Eesti elanike keskkonnateadlikkuse uuring 2024*.
8. P. Post (ed.), *Kliimamuutuste ABC: põhjused, mõjud, lahendused* (Tartu Ülikool, 2024).
9. G. Bianchi, U. Pisiotis, M. Cabrera, *GreenComp: The European sustainability competence framework* (Publications Office of the European Union, 2022); D. Li, L. S. Zhao, S. Ma, S. Shao, L. Zhang, What influences an individual's pro-environmental behavior? A literature review. – *Resources, Conservation and Recycling* 146, 2019; see also Turu-uuringute AS, Tallinna Ülikool, *Eesti elanike keskkonnateadlikkuse uuring 2024*.
10. P. Post (ed.), *Kliimamuutuste ABC: põhjused, mõjud, lahendused* (Tartu Ülikool, 2024).
11. OECD, *PISA 2022 results (Volume I): The state of learning and equity in education* (OECD Publishing, 2023).
12. Estonian Ministry of the Environment, Estonian Ministry of Education and Research, *Keskkonnahariduse ja -teadlikkuse tegevuskava 2023–2025* (2023).
13. Estonian Ministry of the Environment, Estonian Ministry of Education and Research, *Keskkonnahariduse ja -teadlikkuse tegevuskava 2023–2025* (2023).
14. European Citizen Science Association, *Ten principles of citizen science* (2015).
15. Estonian Ministry of the Environment, Estonian Ministry of Education and Research, *Keskkonnahariduse ja -teadlikkuse tegevuskava 2023–2025* (2023); Säästva arengusõnaseletusi: Keskkonnaharidus. – SEI Tallinn, 2024, http://www.seit.ee/sass.
16. G. Bianchi, U. Pisiotis, M. Cabrera, *GreenComp: The European sustainability competence framework* (Publications Office of the European Union, 2022).
17. https://rohelinekool.ee/
18. P. Post (ed.), *Kliimamuutuste ABC: põhjused, mõjud, lahendused* (Tartu Ülikool, 2024).
19. Roheoskuste programm 2023–2026. – Haridus- ja Noorteamet, last updated 24.09.2025, https://harno.ee/roheoskuste-programm.
20. S. Fiske, Climate skepticism inside the Beltway and across the Bay. – S. Crate, M. Nuttall (eds.), *Anthropology and climate change: From actions to transformations* (Routledge, 2016).
21. E. Horgmo, G. Maciniene, *The Orkla sustainable life barometer* (Orkla, 2021); Eesti inimesed on Põhja- ja Baltimaade suurimad kliimaskeptikud. – *Orkla*, 24.03.2023.
22. Eurobarometer, *Attitudes of Europeans towards the environment* (2024).
23. Säästva arengu sõnaseletusi: Ökoloogiline jalajälg. – SEI Tallinn, 2024, http://www.seit.ee/sass.
24. A. Gal, D. Gan, Transformative sustainability education in higher education. – *Journal of Transformative Education* 18 (4), 2020; M. Kangur, L. Puusepp (ed.), *Tervikliku eluviisi alused. Gaia hariduse käsiraamat* (Eesti Teadusagentuur, 2020).
25. See e.g. R. Duit, D. F. Treagust, A. Widodo, Teaching science for conceptual change: Theory and practice. – S. Vosniadou (ed.), International handbook for conceptual change (Routledge, 2013); M. J. Jacobson et al., Designs for learning about climate change as a complex system. – *Learning and Instruction* 52, 2017; see also G. Arro, M. Suškevičs, V. Runnel, A. Tuusti, Supporting sustainability in education requires changes not only in content but also in teaching methods. – E. Kindsiko (ed.), *Estonian Human Development Report 2026. Education reflected in society* (Estonian Cooperation Assembly, 2026); A. Annist, P. Post, J. Terasmaa, Educational institutions can bridge the gap between climate awareness and climate-responsible behaviour. – E. Kindsiko (ed.), *Estonian Human Development Report 2026. Education reflected in society* (Estonian Cooperation Assembly, 2026).
26. OECD, *PISA 2022 results (Volume V): Learning strategies and attitudes for life* (OECD Publishing, 2024).
27. R. Portus et al., Exploring the environmental value action gap in education research. – *Environmental Education Research* 30 (6), 2024; see also A. Annist, P. Post, J. Terasmaa, Educational institutions can bridge the gap between climate awareness and climate-responsible behaviour. – E. Kindsiko (ed.), Estonian Human Development Report 2026. *Education reflected in society* (Estonian Cooperation Assembly, 2026).
28. University of Tartu's greenhouse gas footprint 2019–2024. – University of Tartu, 28.11.2024, https://ut.ee/en/greenhouse-gas-footprint; Greenhouse Gas Quantification. – Tallinn University of Technology, https://www.ghg.ee/.