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Editorial

Education for Sustainability in Times of Complexity and Change

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Dear readers and members of Daugavpils University UNESCO Chair Open Network of the *Journal of Teacher Education for Sustainability* (JTES), it is our pleasure to introduce Volume 27, Issue 2 (2025) of the JTES. This issue contains 15 research papers representing authors from 13 countries. The summaries of all research papers are provided below.

The authors of the JTES articles offer research experiences that directly or indirectly affect the complementary relationship between the *Earth's planetary system and the education system*. Changes in one of these systems cause effects or create opportunities in the other and, in real interaction, they are implemented through dynamic, nonlinear, reversible, coevolutionary adaptations. Development in education affects human behavior, leaves an impact on the Earth system, and preserves people's connection to the Earth. This is the connection of complex processes of education and the planetary system with its deepest roots. This complementary relationship has not yet been sufficiently exploited in educational research. We invite researchers to engage in deeper participatory research, as the door to a complex approach is open.

In this perspective, the preservation of human connection with the Earth system at various levels and learning from the Earth has not been studied in sufficient depth. In addition, the sustainability perspective provides deeper insight into many concepts that are currently familiar. For example, "innovation" from the perspective of preserving the connection with the Earth can be seen as the emergence of a "new form of sensitivity" or the way in which life and living things renew their connection with the world and how a continuous transformation of self-identity occurs, and relationships, sensitivity and forms

of action change, which allow understanding and explaining participation in a complex way. Currently, at the beginning of the Anthropocene era, a large number of complex educational issues that are difficult to solve, or even unsolvable, have accumulated. They have become an urgent challenge for education researchers and for everyone involved in education, as they distort people's current understanding of education, innovation, the future, and themselves.

In the first paper, *Digital Transformation of Education and Social Inclusion: The Case of Ukrainian Refugees in the Baltic States*, the study examines the role of digital educational technologies in facilitating refugees' social, linguistic, and economic integration. Using correlation, regression, and multivariate factor analyses, the study assesses the impact of participation in digital educational programs on language proficiency, employment, and social activity. The results highlight the importance of expanding digital skills development and cross-sector collaboration to promote inclusive and effective integration policies.

In the second paper, *'There is no Cloud?' Awareness of Digital Technology in a Sustainability Perspective in Teacher Education*, the author emphasizes that in postdigital societies, digital tools are increasingly embedded in schooling, offering both educational benefits and sustainability challenges. This action research study explores an instructional design supporting Norwegian student teachers in critically examining digital tools from a sustainability perspective.

In the third paper, *Towards Sustainability of Teachers: A Comparative Analysis of Three Baltic Countries*, the authors explore teacher sustainability in Lithuania, Estonia, and Latvia using data from TALIS 2018. Focusing on teachers' moral commitment to all students, capacity building through networks, and deep learning, the findings show a shared emphasis on inclusive moral goals across the three countries. However, Lithuanian teachers report lower levels of collaboration, while Estonian teachers demonstrate the strongest engagement in long-term professional learning.

The fourth paper, *Silent Communication: Pedagogical Pathways Between Environmental Agents' Internal and External Conversations in School Climate Change Action*, examines how environmental agents in schools translate internal reflection into shared action on climate change. Drawing on Archer's modes of reflexivity and Habermas's communicative action, a critical ethnographic approach analyzes offline and online interactions during school-based climate action. Silent communication emerges as a key link between personal reflexivity and collective climate action, with implications for Education for Sustainable Development in schools.

In the fifth paper, *Beyond Sustainability Knowledge: How Awareness Drives Sustainable Actions*, the authors reveal the relationship between knowledge of environmental and social impacts and sustainable consumption behavior, with particular attention to the mediating role of sustainability awareness. The results highlight the central role of awareness in translating knowledge into sustainable consumption practices.

The sixth paper, *A Toolbox for Integrating the One Health Approach Into Biology Teacher Training*, proposes integrating the One Health approach into biology teacher education to address fragmented teaching of human, animal, and environmental health. It presents

an instructional activity using mitosis within an ecotoxicology context to support pre-service teachers in exploring health interconnections through inquiry and reflection.

In the seventh paper, *Primary School Student Teachers' Perceptions of Their Sustainability Competencies*, the authors claim that teacher education plays a key role in advancing sustainability, yet research on sustainability competencies has largely relied on quantitative approaches. The study addresses this gap through a qualitative analysis of primary school student teachers' self-assessments of five sustainability competencies. By illuminating how student teachers perceive their sustainability competencies, the study informs the development of pedagogy that more effectively supports sustainability-oriented teacher education.

The authors of the eighth paper, *Reflective Tool for Sustainability Thinking – Craft, Design and Technology Student Teachers' Narratives*, highlight that teacher education plays a central role in sustainability education, with Craft, Design, and Technology (CDT) offering a key context in Finland. This study explores CDT student teachers' understandings of sustainable development in their personal lives and teaching through narrative survey responses.

In the ninth paper, *Well-Being Monitoring Within Human-Environment Interactions: A Systematic Review*, the systematic literature review examines well-being monitoring from a human–environment interaction perspective, focusing on criteria, data sources, and models. Analysis of 73 studies reveals a dominant anthropocentric approach, limited causal and quantitative research, weak attention to feedback from human to environmental well-being, and an underrepresentation of local-scale, dynamic, and technology-supported models. The findings highlight the need to integrate systems thinking and environmental monitoring competencies into sustainability education.

The team of authors in the tenth paper, *University Students' Emotional States and Academic Engagement: Implications for Sustainable Learning Practices in Higher Education*, explores the role of university students' emotional states in shaping sustainable academic engagement. The findings indicate a moderate level of emotional strain among students, with emotional states having a stronger influence on academic engagement for female students than for male students. The results underscore the importance of addressing students' emotional well-being as a key factor in fostering sustainable engagement in higher education.

The eleventh paper, *Integrating Climate Change Education Into Teacher Education Curricula in Mongolia*, examines the integration of climate change education (CCE) in pre-service teacher education curricula at the Mongolian National University of Education. Using SDG 13 ("Climate Action") learning objectives as an analytical framework, climate-related terms were identified and traced across undergraduate course syllabi. While overall integration remains limited, the study identifies emerging good practices that may support the future mainstreaming of CCE in teacher education and inform curriculum development and policy initiatives.

The twelfth paper, *Windmills of the Young Mind (2): Interpreting and Contextualizing Preschool Children's Perception of the World*, presents findings from a one-year study (2024–2025) examining visual literacy and lexical pliancy in preschool children (aged 5–7) within the framework of Education for Sustainable Development. Focusing on the

concepts of dream, future, freedom, homeland, and security, the analysis shows that young children can operate across multiple conceptual levels, demonstrating cognitive flexibility and emerging multimodal thinking. The findings highlight the importance of early cognitive development in supporting advanced perceptual and information processing skills and provide evidence-based insights for educational policy and practice.

The thirteenth paper, *Well-Being of University Students as a Pillar of Educational Sustainability: A Case Study*, examines university student well-being in the context of educational sustainability amid ongoing global and societal challenges. The study assessed subjective, psychological, and psychosocial well-being, along with life satisfaction, emotional experiences, and flourishing. The findings highlight the importance of systematic monitoring and support of student well-being in higher education.

The authors of the fourteenth paper, *Dimension of Global Competence in Future Teacher Education Programs: Comparative Analysis of Lithuania, Latvia and Poland*, explore global competence for sustainability, as it enables learners to understand global processes and translate this understanding into responsible local action, with action competence as its central practical dimension. This paper presents a comparative analysis of teacher education programs at Vilnius University Šiauliai Academy (Lithuania), Daugavpils University (Latvia), and Jan Kochanowski University of Kielce (Poland). The findings show that while all three programs recognize action competence as integral to global competence, they operationalize it differently: through structured planning and evaluation in Latvia, reflective and identity-focused practice in Lithuania, and civic- and ethics-oriented engagement in Poland.

The authors of the final paper, *From Metaphors and Complicated Approach to a Complex Pedagogical Method*, examine the situation that has developed around the future of education and has begun to affect people with various unexpected turns and uncertainties in their daily lives. Education affects everyone and shapes the future of all people. Therefore, researchers of participatory ideas have addressed the uncertainties and problems of recent years in various situations. Drawing on the techniques of reflexive hermeneutics of their lived experience, they argue for recognizing the uncertainties of using current complicated and complex approaches when understanding the complex nature of pedagogy.

We are very thankful to all the authors who contributed to the development of the *Journal of Teacher Education for Sustainability* – Volume 27, Issue 2, 2025. We gratefully acknowledge the reviewers for their insightful and constructive comments, which have substantially enhanced the quality of the manuscripts. The research papers of this issue are available at <https://reference-global.com/journal/JTES>.