TPACK and Sustainable Development: Exploring Technology Integration in Teacher Education

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Abstract

Education for Sustainable Development (ESD) aims to equip learners with the knowledge, skills, values, and attitudes necessary to address contemporary social, economic, and environmental challenges. In the digital era, digital learning platforms have emerged as powerful tools for enhancing the accessibility, inclusivity, and effectiveness of ESD initiatives. This paper explores the role of digital learning platforms in advancing sustainable development education by facilitating interactive, learner-centered, and collaborative learning experiences. Through features such as multimedia content, virtual simulations, discussion forums, and real-time assessments, these platforms enable learners to engage with complex sustainability issues in meaningful and practical ways. The study highlights how digital learning environments support lifelong learning, promote global citizenship, and foster critical thinking and problem-solving skills essential for achieving the Sustainable Development Goals (SDGs). Furthermore, digital platforms contribute to educational sustainability by reducing dependence on physical resources, expanding educational opportunities to remote and underserved communities, and encouraging flexible learning pathways. However, challenges such as the digital divide, technological infrastructure limitations, and varying levels of digital literacy continue to hinder the equitable implementation of digital learning solutions. The paper emphasizes the need for strategic policy interventions, capacity-building initiatives, and inclusive technological practices to maximize the potential of digital learning platforms in promoting sustainable development. The findings suggest that when effectively integrated into educational systems, digital learning platforms can serve as transformative agents in fostering sustainability-oriented knowledge and competencies among learners, thereby contributing to the realization of a more sustainable and equitable future.

Keywords: Digital Learning Platforms; Education for Sustainable Development (ESD); Sustainable Development Goals (SDGs); Digital Education; Lifelong Learning; Sustainability Competencies.