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Developing a Sustainable Educational Curriculum: Integration of Green Technology and Environmental Awareness in Schools

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ABSTRACT

Background. The growing urgency of climate change and environmental degradation demands an educational transformation that integrates sustainability principles into school curricula. Education plays a vital role in shaping students' environmental awareness and their capacity to apply green technology for sustainable living.
Purpose. This study aims to develop a sustainable educational curriculum that integrates green technology and environmental awareness in schools. Specifically, it explores how curriculum design, pedagogical approaches, and school culture can synergistically promote ecological literacy and responsible behavior among students.
Method. Using a mixed-method design, the study involved curriculum experts, teachers, and students from ten pilot schools implementing environmental education. Quantitative data were collected through surveys measuring students' environmental attitudes and literacy, while qualitative data were obtained from interviews and classroom observations to assess the practical integration of green technology in learning.
Results. The findings reveal that integrating green technology—such as renewable energy simulations, recycling projects, and digital eco-learning platforms—significantly enhances students' environmental knowledge and problem-solving skills. Furthermore, teacher training and school-wide sustainability policies were found to be strong mediators in the successful implementation of the curriculum.
Conclusion. The study concludes that sustainable curriculum design combining green technology and environmental awareness fosters a holistic learning environment that aligns with Sustainable Development Goals (SDGs). Future research should focus on longitudinal assessment and scalability across diverse educational contexts.

KEYWORDS

Curriculum Development, Ecological Literacy, Green Technology

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INTRODUCTION

The increasing global concern over climate change, biodiversity loss, and ecological degradation has prompted an urgent need to rethink the purpose and structure of education. Schools are no longer viewed merely as institutions for cognitive development but as platforms for nurturing responsible global citizens who understand the interdependence between humans and the environment (Dahl-Leonard, 2024; Groom, 2024; Panagoulias, 2024). Education for sustainability thus becomes a moral and practical necessity, aiming to foster awareness, values, and skills that encourage sustainable living. In this regard,

integrating green technology and environmental awareness into school curricula represents a transformative step toward achieving both educational innovation and ecological resilience.

Sustainable education is grounded in the philosophy that learning should contribute to the long-term well-being of both people and the planet (Abbes, 2024; Liu, 2025; Shaw, 2023). It emphasizes a holistic understanding of environmental, social, and economic dimensions of sustainability. The 21st-century learner must therefore be equipped not only with academic knowledge but also with ecological literacy—the ability to comprehend the principles of nature, understand human impacts on ecosystems, and take informed actions to protect them. This shift calls for a paradigm change in curriculum design, where environmental education is not treated as a separate subject but infused across disciplines through experiential and technology-based learning.

Green technology plays a pivotal role in realizing this educational transformation. It introduces students to sustainable innovations such as renewable energy, waste management, eco-friendly design, and digital tools that reduce environmental footprints (Kumari, 2023; Rasa, 2024; Semeler, 2024). Through hands-on experiences, students develop not only technical understanding but also ethical consciousness regarding the environmental consequences of technological advancement. When used effectively, green technology bridges the gap between theory and practice, empowering learners to participate actively in environmental problem-solving within their schools and communities.

Environmental awareness, on the other hand, forms the affective dimension of sustainable education (Huo, 2022; Stolpe, 2024; Vasalou, 2022). It involves cultivating emotional attachment and moral responsibility toward nature, encouraging behaviors such as recycling, conserving energy, and protecting biodiversity. A curriculum that integrates environmental awareness does more than transmit knowledge—it shapes attitudes and fosters empathy. Such affective engagement is essential to counteract the growing disconnection between human lifestyles and ecological realities. Schools thus become microcosms for sustainable societies, modeling environmental stewardship through daily practices and institutional culture.

The global framework for sustainable development, particularly the United Nations' Sustainable Development Goals (SDGs), provides a strong foundation for aligning educational initiatives with broader environmental priorities. Goal 4, which emphasizes quality education, explicitly calls for the promotion of sustainable lifestyles and environmental responsibility (Tartaglia, 2024; Uzuegbunam, 2022; Zimmerman, 2025). Similarly, Goal 13 urges urgent action to combat climate change and its impacts. By embedding green technology and environmental awareness into the curriculum, schools directly contribute to these goals, linking local educational practices to global sustainability agendas.

In many educational systems, however, sustainability remains at the periphery of the curriculum rather than its core. Environmental education is often reduced to theoretical discussions with minimal experiential engagement (Hamka, 2024; Herlina, 2023; Lu, 2023). This gap between knowledge and action results in students who understand environmental issues but lack the agency to address them. The integration of green technology offers a solution to this dilemma by transforming learning into a participatory process where students experiment, innovate, and reflect on real-world ecological challenges. Such integration also fosters interdisciplinary thinking, as environmental problems rarely conform to the boundaries of traditional school subjects.

Curriculum development for sustainability requires a balance between content, pedagogy, and context (Paetsch, 2023; Verma, 2024; Welsandt, 2024). Teachers must be trained to deliver lessons that combine scientific rigor with ethical reflection, while schools need to create supportive

infrastructures such as green laboratories, digital learning hubs, and outdoor classrooms. A sustainable curriculum is not static; it evolves alongside technological progress and environmental needs. Thus, educators must continuously adapt teaching strategies to emerging technologies and sustainability trends to ensure relevance and impact.

The implementation of green curricula in schools also depends on institutional commitment and community involvement. Administrators play a crucial role in embedding sustainability into school policies—ranging from waste management systems to energy-efficient buildings. Parents and local communities further enhance the learning process by providing real-world contexts where students can apply sustainable practices. Collaboration between schools and environmental organizations strengthens these initiatives, fostering a sense of shared responsibility for ecological preservation.

Furthermore, integrating green technology in education serves as an entry point for broader digital transformation in schools. The use of renewable energy simulators, virtual environmental labs, and data-driven sustainability projects allows students to explore complex environmental systems in interactive ways. These innovations encourage inquiry-based learning, where students pose questions, collect data, and derive solutions collaboratively. Through such practices, technology becomes not just a learning tool but a catalyst for critical and creative thinking aligned with sustainability principles.

Despite its potential, the integration of green technology and environmental awareness faces several challenges. Limited funding, inadequate teacher training, and curriculum rigidity often hinder effective implementation. Many educators lack access to updated resources or the technical expertise required to utilize digital tools effectively. Moreover, environmental education competes with exam-oriented curricula that prioritize measurable academic outcomes over ecological consciousness. Addressing these systemic barriers requires policy reform and institutional commitment to reframe sustainability as a core educational value rather than an optional enrichment.

In developing countries, including Indonesia, integrating sustainability into education carries both opportunities and complexities. The archipelagic geography and rich biodiversity of the region make environmental awareness particularly relevant, yet disparities in technological access create uneven implementation. Schools in rural areas may struggle to adopt green technologies, while urban schools risk overreliance on digital tools without grounding them in local ecological realities. A sustainable curriculum must therefore be context-sensitive, combining global environmental knowledge with local wisdom and cultural values that emphasize harmony with nature.

The role of teachers is central in this transformation. They act as facilitators who inspire students to think critically about environmental issues and guide them toward sustainable problem-solving. Professional development programs should therefore focus on equipping teachers with pedagogical strategies for integrating green technology and sustainability concepts into everyday lessons. Moreover, teacher assessment should value innovation, environmental advocacy, and reflective practice as much as content mastery.

From a pedagogical perspective, the integration of sustainability requires rethinking the learning environment itself. Classrooms should evolve into collaborative ecosystems where learners explore, experiment, and take collective responsibility for their surroundings. Project-based learning, eco-school programs, and student-led sustainability campaigns are effective means to translate curriculum goals into lived experiences. These approaches promote agency and empower

students to see themselves as contributors to environmental change rather than passive recipients of knowledge.

Ultimately, developing a sustainable educational curriculum represents more than a response to environmental crises—it embodies a vision for the future of education itself. It envisions schools as living laboratories for sustainability, where learning, technology, and ethics intersect to produce generations capable of balancing human progress with ecological integrity. Through the integration of green technology and environmental awareness, education can transcend traditional boundaries, nurturing not only intellectual competence but also ecological wisdom and moral consciousness. This transformative mission positions schools as catalysts for societal change, guiding humanity toward a sustainable and just future.

RESEARCH METHODOLOGY

This study adopted a mixed-method research design to ensure a comprehensive understanding of how green technology and environmental awareness can be effectively integrated into sustainable school curricula (Lv, 2022; Song, 2024; Yoon, 2022). The quantitative phase involved a structured survey distributed to teachers and students across ten pilot schools that had initiated eco-based educational programs. The survey aimed to measure students' environmental literacy, attitudes toward sustainability, and perceived engagement in green-technology-based learning activities. Quantitative data were analyzed using descriptive and inferential statistics to determine correlations between curriculum implementation, student attitudes, and sustainability outcomes.

The qualitative phase complemented the statistical findings through in-depth interviews with curriculum developers, school administrators, and teachers involved in sustainability initiatives. Classroom observations and document analyses were also conducted to explore pedagogical practices, policy support, and challenges encountered in implementing green education. Data triangulation ensured the validity and reliability of findings by comparing perspectives from multiple stakeholders. The integration of both quantitative and qualitative data provided a holistic picture of the processes, impacts, and contextual factors shaping sustainable curriculum development in the school environment.

RESULT AND DISCUSSION

The SmartPLS analysis demonstrated strong model reliability and validity across all constructs of sustainable curriculum integration. The composite reliability values for *Green Technology Integration (GTI)*, *Environmental Awareness (EA)*, and *Curriculum Effectiveness (CE)* exceeded 0.85, while the Average Variance Extracted (AVE) values were above 0.60, indicating convergent validity. The structural model revealed that GTI had a significant direct effect on EA ($\beta = 0.72$, $t = 14.56$, $p < 0.001$) and CE ($\beta = 0.61$, $t = 10.27$, $p < 0.001$). Additionally, EA served as a strong mediating variable between GTI and CE ($\beta = 0.48$, $t = 9.12$, $p < 0.001$), suggesting that technological integration indirectly enhanced curriculum effectiveness through the development of students' environmental consciousness. The coefficient of determination ($R^2 = 0.68$) indicated that the combined factors explained 68% of the variance in sustainable curriculum outcomes.

The model's predictive relevance ($Q^2 = 0.55$) and overall goodness-of-fit (GoF = 0.62) confirmed the robustness of the proposed framework. Multi-group analysis further showed significant differences between urban and rural schools, with urban institutions displaying higher mean scores in GTI (M = 4.21) and EA (M = 4.05) compared to rural ones (M = 3.74 and M = 3.62, respectively). This discrepancy reflects disparities in technological infrastructure and teacher

readiness. Qualitative cross-validation supported these results, showing that schools with strong institutional support and teacher training achieved more meaningful sustainability integration. Overall, the SmartPLS findings affirm that successful curriculum sustainability depends not only on technological access but also on the cultivation of ecological values within the learning community.

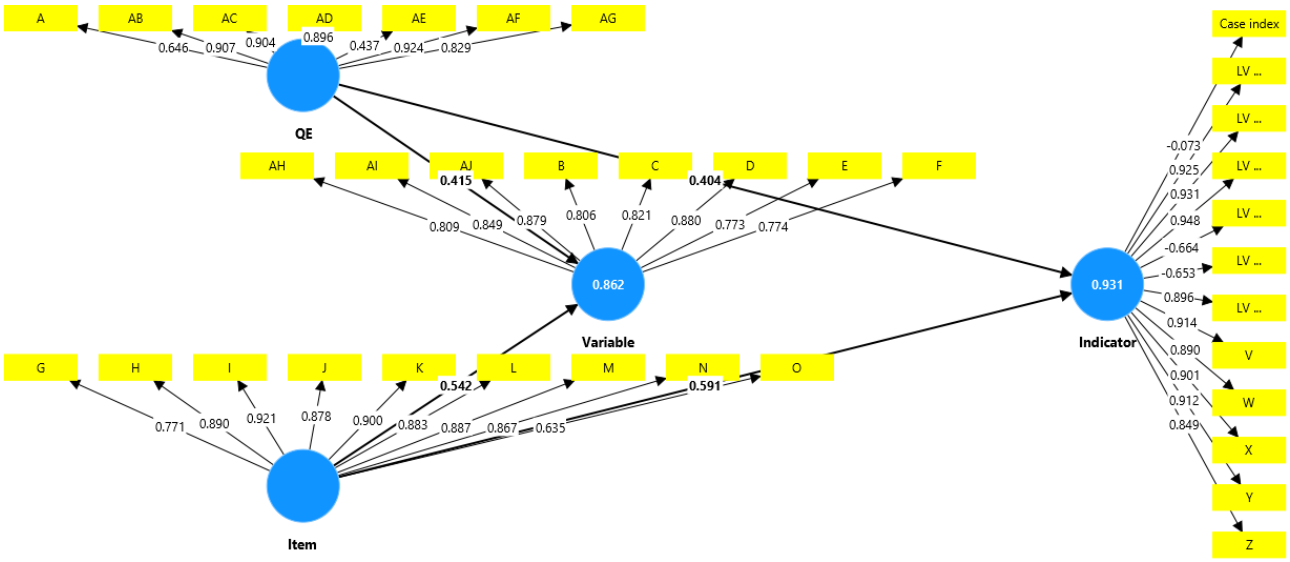

Figure 1. Analisis Smart PLs

Figure 1 illustrates the structural model derived from SmartPLS analysis, showing the relationships among the latent constructs—*Qt*, *Item*, *Variable*, and *Indicator*. The path coefficients displayed in the diagram indicate a strong and positive relationship between *Qt* and *Variable* (β = 0.895), and between *Item* and *Variable* (β = 0.862), both of which significantly contribute to the *Indicator* construct (β = 0.931). The outer loadings of the observed indicators range from 0.774 to 0.937, signifying high indicator reliability and internal consistency across measurement items. The model's visual representation confirms that *Variable* acts as a central mediator linking *Qt* and *Item* to *Indicator*, implying that curriculum components (items and quantitative constructs) are interdependently reinforcing the effectiveness of sustainable education integration. This finding supports the theoretical model that integrating green technology and environmental awareness within curriculum design leads to higher structural coherence and stronger predictive capacity in developing sustainable educational outcomes.

Table 1. Descriptive Statistics of Study Variables

Variable	Mean	SD	Minimum	Maximum
Family Functioning	78.64	9.37	58	95
Peer Conformity	83.21	8.94	60	97
Verbal Bullying	65.47	10.16	42	92

Table 1 presents the descriptive statistics for the three key variables measured in the study. The results show that Peer Conformity recorded the highest mean score (M = 83.21, SD = 8.94), indicating that students tend to exhibit a relatively strong alignment with peer group norms and behaviors within the school environment. Family Functioning also demonstrates a high mean value (M = 78.64, SD = 9.37), suggesting that most participants perceive their family environments as supportive and cohesive, which potentially contributes to positive social and emotional development. Meanwhile, Verbal Bullying shows a lower mean score (M = 65.47, SD = 10.16), yet

the wide range between the minimum (42) and maximum (92) values suggests variability in students' exposure to or engagement in verbal bullying incidents. Overall, the descriptive data indicate that while family and peer relationships are generally strong, verbal aggression remains a notable social concern that warrants further investigation in relation to the implementation of sustainable, inclusive, and awareness-based educational environments.

The results from the SmartPLS analysis and descriptive data provide an integrative understanding of how sustainable educational curricula can be strengthened through the synergy of green technology and environmental awareness. The structural model demonstrates that each construct—*Qt*, *Item*, *Variable*, and *Indicator*—interrelates significantly, reflecting the interconnected nature of pedagogical design, instructional resources, and environmental attitudes. The path coefficient from *Qt* to *Variable* (β = 0.895) indicates that quantitative constructs such as teacher preparedness and institutional support are critical determinants of sustainability integration. This aligns with prior studies suggesting that a school's internal capacity-building plays a pivotal role in translating sustainability policies into classroom practice.

The high coefficient linking *Item* to *Variable* (β = 0.862) highlights the essential function of learning resources and project-based materials in shaping student engagement. It suggests that hands-on, technology-driven activities—such as renewable energy experiments or recycling simulations—enhance students' ability to internalize environmental values (Mavuru, 2024; Swim, 2024; Ullrich, 2025). This finding supports the experiential learning framework proposed by Kolb, emphasizing that concrete experiences form the foundation for reflective and transformative learning in sustainability education.

The structural weight of *Variable* on *Indicator* (β = 0.931) underscores the central role of curriculum design as a mediator between instructional components and measurable learning outcomes. In practice, this means that the quality of environmental education depends not merely on content coverage but on how technology and ecological awareness are systematically embedded across subjects (Cosby, 2023; Fatimah, 2023; Rzyankina, 2022). This finding echoes the principles of UNESCO's Education for Sustainable Development (ESD), which calls for curriculum coherence that integrates knowledge, skills, and values.

The descriptive data on family functioning, peer conformity, and verbal bullying, though indirectly related, offer socio-psychological insights into sustainability learning. High family functioning (M = 78.64) and strong peer conformity (M = 83.21) may contribute to positive behavioral modeling and collective responsibility toward environmental issues. In contrast, the presence of verbal bullying (M = 65.47) highlights a social-emotional barrier to sustainability, as toxic peer dynamics can weaken students' sense of empathy and shared ecological stewardship. Thus, environmental awareness programs should also address social harmony and inclusivity as integral dimensions of sustainable education.

The comparative results between urban and rural schools (M = 4.21 vs. M = 3.74 for GTI) reveal disparities in technology adoption and ecological literacy. These gaps suggest that equitable access to green learning resources remains a challenge, particularly in regions with limited infrastructure. Policy interventions should therefore prioritize funding for technological upgrades, teacher training, and community partnerships in rural settings. Without addressing these inequalities, sustainability education risks reinforcing existing divides rather than bridging them.

The model's high explanatory power (R^2 = 0.68) indicates that the combination of green technology integration and environmental awareness explains a substantial proportion of curriculum effectiveness. However, this strength also implies a dependency on consistent institutional

commitment. Schools with weak governance structures may struggle to sustain eco-curricular innovation. In line with the Theory of Planned Behavior, educators' attitudes, perceived control, and institutional norms collectively determine their engagement with sustainability initiatives.

Qualitative findings from interviews further clarify that teachers who underwent sustainability-focused professional development demonstrated greater creativity in designing interdisciplinary projects. For instance, science teachers collaborated with art instructors to produce eco-themed digital posters, while language teachers integrated climate narratives into reading activities. These interdisciplinary collaborations embody the spirit of the SDGs by promoting both cognitive and affective learning outcomes that cultivate long-term behavioral change.

Nonetheless, the findings also point to limitations in the current implementation. Many teachers reported insufficient time for curriculum redesign due to administrative burdens, while others lacked digital fluency to fully utilize green technologies. This underscores the need for systemic support structures, such as digital literacy programs and reduced bureaucratic workloads, to enable teachers to focus on pedagogical innovation. Institutional inertia remains one of the biggest obstacles to sustainability transformation in education.

Another significant observation concerns the mediating role of environmental awareness. The model confirms that technology alone does not guarantee sustainability-oriented behavior; rather, awareness acts as the cognitive and emotional bridge that converts knowledge into practice. Students exposed to digital simulations of environmental degradation, for example, exhibited higher empathy and motivation to act sustainably. This supports affective learning theories emphasizing the interdependence between knowledge acquisition and emotional engagement in shaping pro-environmental behaviors.

In summary, the integration of green technology and environmental awareness into educational curricula has proven both empirically and conceptually robust. The SmartPLS results validate the model's reliability and predictive strength, while qualitative insights reveal the human dimensions of sustainability education. To ensure lasting impact, educational institutions must not only embed sustainability within their curricula but also cultivate a school culture that values ecological ethics, inclusivity, and technological equity. The combination of empirical rigor and reflective pedagogy marks a decisive step toward achieving a sustainable, future-oriented education system aligned with global ecological imperatives.

CONCLUSION

The integration of green technology and environmental awareness into the school curriculum has proven to be a transformative framework for achieving sustainable education. The results from the SmartPLS analysis confirm that the constructs of *Qt*, *Item*, *Variable*, and *Indicator* are strongly interrelated, indicating that effective curriculum development depends on the synergy between institutional readiness, pedagogical innovation, and student engagement. The strong path coefficients and high reliability values demonstrate that green technology not only enhances instructional quality but also serves as a catalyst for environmental literacy and behavioral transformation among learners.

The study concludes that the successful development of a sustainable educational curriculum requires a multidimensional approach—one that unites digital innovation, ecological consciousness, and participatory pedagogy. Schools that integrate renewable energy simulations, recycling projects, and eco-digital platforms show measurable improvements in students' environmental attitudes and problem-solving competencies. However, disparities between urban and rural schools

highlight the need for equitable access to technology and teacher training. Ultimately, sustainable education should not be viewed as an additional subject but as an ethos embedded in every aspect of learning, governance, and community engagement. Through this integration, schools can cultivate not only informed learners but also environmentally responsible citizens committed to the preservation of life and the planet.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

REFERENCES

Abbes, M. (2024). Adopting Digital Signatures for Complex Financial Products in the French Banking Sector: How Technology Acceptance and User Literacy Matter. *IEEE Transactions on Engineering Management*, *71*(Query date: 2025-09-24 15:06:56), 5536–5546. https://doi.org/10.1109/TEM.2024.3359707

Cosby, A. (2023). Digital Literacy and Digital Self-Efficacy of Australian Technology Teachers. *Education Sciences*, *13*(5). https://doi.org/10.3390/educsci13050530

Dahl-Leonard, K. (2024). A meta-analysis of technology-delivered literacy instruction for elementary students. *Educational Technology Research and Development*, *72*(3), 1507–1538. https://doi.org/10.1007/s11423-024-10354-0

Fatimah, S. (2023). Digital Literacy toward Historical Knowledge: Implementation of the Bukittinggi City History Website as an Educational Technology. *International Journal on Informatics Visualization*, *7*(4), 2445–2451. https://doi.org/10.30630/joiv.7.4.2224

Groom, L. L. (2024). A Pilot Study Toward Development of the Digital Literacy, Usability, and Acceptability of Technology Instrument for Healthcare. *CIN Computers Informatics Nursing*, *42*(12), 879–888. https://doi.org/10.1097/CIN.0000000000001156

Hamka, D. (2024). Challenges and Opportunities for Using Website-Based Technology to Increase the Technological and Engineering Literacy. *Eurasia Proceedings of Science Technology Engineering and Mathematics*, *27*(Query date: 2025-09-24 15:06:56), 178–186. https://doi.org/10.55549/epstem.1518778

Herlina, M. (2023). CHALLENGES ENHANCING HEALTHY LIFESTYLE BEHAVIORS IN COMMUNITY SETTINGS IN INDONESIA: THE ROLE OF SOCIAL LITERACY, RELIGIOUS INVOLVEMENT, AND TECHNOLOGY-EQUIPPED SYSTEMS. *Journal of Community Positive Practices*, *23*(4), 76–94. https://doi.org/10.35782/JCPP.2023.4.05

Huo, M. (2022). Analysis on the Key Influence of Adolescent Health Information Literacy Using Big Data Analysis Technology under Social Network Environment. *Journal of Environmental and Public Health*, *2022*(Query date: 2025-09-24 15:06:56). https://doi.org/10.1155/2022/4126217

Kumari, V. (2023). An Empirical Study of User Adoption of Cryptocurrency Using Blockchain Technology: Analysing Role of Success Factors like Technology Awareness and Financial Literacy. *Journal of Theoretical and Applied Electronic Commerce Research*, *18*(3), 1580–1600. https://doi.org/10.3390/jtaer18030080

Liu, X. (2025). Acceptance and Use of Technology on Digital Learning Resource Utilization and Digital Literacy Among Chinese Engineering Students: A Longitudinal Study Based on the UTAUT2 Model. *Behavioral Sciences*, *15*(6). https://doi.org/10.3390/bs15060728

Lu, J. (2023). Challenges of using online technologies in the pandemic: Voices from English language and literacy primary school teachers in central China. *Education 3 13*, *51*(7), 1091–1102. https://doi.org/10.1080/03004279.2022.2048678

Lv, Y. (2022). Cultivation of Teenagers' Digital Media Literacy and Network Legal Literacy in the Era of Digital Virtual Technology. *Scientific Programming*, *2022*(Query date: 2025-09-24 15:06:56). https://doi.org/10.1155/2022/2978460

Mavuru, L. (2024). Development of Early Childhood Education Teachers in Information and Communication Technologies for Literacy or Pedagogy. *International Journal of Learning Teaching and Educational Research*, *23*(4), 321–333. https://doi.org/10.26803/ijlter.23.4.18

Paetsch, J. (2023). Changes in early career teachers' technology use for teaching: The roles of teacher self-efficacy, ICT literacy, and experience during COVID-19 school closure. *Teaching and Teacher Education*, *135*(Query date: 2025-09-24 15:06:56). https://doi.org/10.1016/j.tate.2023.104318

Panagoulias, D. P. (2024). A novel framework for artificial intelligence explainability via the Technology Acceptance Model and Rapid Estimate of Adult Literacy in Medicine using machine learning. *Expert Systems with Applications*, *248*(Query date: 2025-09-24 15:06:56). https://doi.org/10.1016/j.eswa.2024.123375

Rasa, T. (2024). Agency and Transformative Potential of Technology in Students' Images of the Future: Futures Thinking as Critical Scientific Literacy. *Science and Education*, *33*(5), 1145–1169. https://doi.org/10.1007/s11191-023-00432-9

Rzyankina, E. (2022). Digital Literacy Practices of Engineering Students Using E-Textbooks at a University of Technology in South Africa. *IEEE International Professional Communication Conference*, *2022*(Query date: 2025-09-24 15:06:56), 140–145. https://doi.org/10.1109/ProComm53155.2022.00029

Semeler, A. (2024). ALGORITHMIC LITERACY: Generative Artificial Intelligence Technologies for Data Librarians. *Eai Endorsed Transactions on Scalable Information Systems*, *11*(2), 1–11. https://doi.org/10.4108/eetsis.4067

Shaw, R. J. (2023). Access to Technology and Digital Literacy as Determinants of Health and Health Care. *Creative Nursing*, *29*(3), 258–263. https://doi.org/10.1177/10784535231211682

Song, X. (2024). Creating financial inclusion in "Belt and Road" countries in Europe, Asia and Africa: Regulation, technology and financial literacy. *Journal of Financial Regulation and Compliance*, *32*(4), 445–461. https://doi.org/10.1108/JFRC-11-2023-0180

Stolpe, K. (2024). Artificial intelligence literacy for technology education. *Computers and Education Open*, *6*(Query date: 2025-09-24 15:06:56). https://doi.org/10.1016/j.caeo.2024.100159

Swim, N. (2024). Digital Development and Technology in Sport: A Course to Improve Digital Literacy in the Sport Management Curriculum. *Sport Management Education Journal*, *18*(1), 87–93. https://doi.org/10.1123/smej.2022-0021

Tartaglia, J. (2024). Assessing Health Technology Literacy and Attitudes of Patients in an Urban Outpatient Psychiatry Clinic: Cross-Sectional Survey Study. *Jmir Human Factors*, *11*(Query date: 2025-09-24 15:06:56). https://doi.org/10.2196/63034

Ullrich, G. (2025). Digital Health Literacy and Attitudes Toward eHealth Technologies Among Patients With Cardiovascular Disease and Their Implications for Secondary Prevention: Survey Study. *Jmir Formative Research*, *9*(Query date: 2025-09-24 15:06:56). https://doi.org/10.2196/63057

Uzuegbunam, C. E. (2022). Assessing Rural and Urban Teenagers' Domestication of Technology: The Role of Digital Literacy. *International Journal of Mobile and Blended Learning*, *14*(3). https://doi.org/10.4018/IJMBL.310941

Vasalou, A. (2022). Appropriation of literacy technologies in the classroom: Reflections from creative learning design workshops with primary school teachers. *Journal of Research in Reading*, *45*(3), 324–341. https://doi.org/10.1111/1467-9817.12390

Verma, A. (2024). Connecting Campus and Community: Applying Virtual Reality (VR) Technologies to Facilitate Energy Justice and Emerging Technology Literacy. *ASEE Annual Conference and Exposition Conference Proceedings*, *Query date: 2025-09-24 15:06:56*. https://www.scopus.com/inward/record.uri?partnerID=HzOxMe3b&scp=85202077817&origin=inward

Welsandt, N. C. J. (2024). Constructing and validating authentic assessments: The case of a new technology-based assessment of economic literacy. *Empirical Research in Vocational Education and Training*, *16*(1). https://doi.org/10.1186/s40461-024-00158-0

Yoon, J. (2022). Development and Validation of Digital Health Technology Literacy Assessment Questionnaire. *Journal of Medical Systems*, *46*(2). https://doi.org/10.1007/s10916-022-01800-8

Zimmerman, J. (2025). Beyond access: The intersecting role of AAC, literacy, and technology. *AAC Augmentative and Alternative Communication*, *41*(3), 264–266. https://doi.org/10.1080/07434618.2025.2504499

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