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Digital Literacy and Cultural Narratives for Social Sustainability in Primary Education Transformation

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Abstract

This study investigates the role of digital education in promoting social sustainability, cultural preservation, and equitable access to knowledge in the context of primary education. The research focuses on an Islamic primary school in East Java, Indonesia, which actively implements digital transformation through adaptive learning technologies, collaborative platforms, and digital humanities integration. The study aims to understand how these digital tools align with Sustainable Development Goals (SDGs), particularly in fostering inclusion and environmental responsibility. Employing a qualitative case study design, data were collected through semi-structured interviews, focus group discussions, and direct classroom observations involving 16 participants, including school leaders, teachers, parents, and program facilitators. The findings reveal that the integration of post digital aesthetics and sustainability initiatives supports inclusive and ethical educational practices, while also challenging deterministic views of technology. The study emphasizes that digital transformation in education must be culturally contextualized and ethically guided to ensure long-term impact. Future research is recommended to explore scalable models across diverse educational settings.

Keywords: cultural narratives, education equity, social studies, sustainability

Abstrak

Penelitian ini bertujuan untuk mengkaji peran pendidikan digital dalam mendorong keberlanjutan sosial, pelestarian budaya, dan akses pengetahuan yang setara dalam konteks pendidikan dasar. Subjek penelitian ini adalah sebuah sekolah dasar Islam di Jawa Timur, Indonesia, yang secara aktif mengimplementasikan transformasi digital melalui teknologi pembelajaran adaptif, platform kolaboratif, dan integrasi humaniora digital. Penelitian ini menggunakan pendekatan studi kasus kualitatif. Data dikumpulkan melalui wawancara semi-terstruktur, diskusi kelompok terarah (FGD), dan observasi langsung di dalam kelas, melibatkan 16 partisipan yang terdiri dari kepala sekolah, guru, orang tua, dan fasilitator program literasi digital serta keberlanjutan. Hasil penelitian menunjukkan bahwa integrasi estetika postdigital dan inisiatif keberlanjutan mendukung praktik pendidikan yang inklusif dan etis, sekaligus menantang pandangan deterministik terhadap teknologi. Penelitian ini menekankan bahwa transformasi digital dalam pendidikan harus dipandu oleh konteks budaya dan nilai-nilai etis untuk memberikan dampak jangka panjang. Studi lanjutan disarankan untuk mengeksplorasi model yang dapat diterapkan secara luas di berbagai latar pendidikan.

Kata Kunci: *narasi budaya, kesetaraan pendidikan, studi sosial, keberlanjutan*

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Introduction

The rapid advancement of digital technologies has transformed education in profound ways, reshaping both how students learn and how institutions operate (El Hilali et al., 2020; Litterio, 2020; Thompson, 2021). Digital tools offer promising benefits, such as more flexible learning environments, personalized instruction, and streamlined administrative processes. However, alongside these advantages come pressing concerns about equity, ethics, and sustainability. A key perspective in understanding these changes is technological determinism, which suggests that technology is the driving force behind societal and educational transformation (David Webster, 2017; Quy et al., 2023). While this view highlights the power of technology to reshape learning, it often overlooks the broader social, cultural, and environmental implications of digital education (Gomez-Trujillo & Gonzalez-Perez, 2022).

Beyond these social inequalities, the widespread use of digital technology also presents significant environmental challenges, such as high energy consumption and the growing volume of electronic waste, which further widen the digital divide (E. Choi & Park, 2022; Fernández-Mateo & Franco-Barrera, 2020). Ethical concerns are also becoming more pressing as proprietary digital platforms increasingly shape the educational landscape, raising important questions about data governance, privacy, and the risk of undermining democratic values when technological development is driven by a handful of large corporations (Bedford-Strohm, 2020). This complex reality highlights the need for a comprehensive framework that not only maximizes the logistical benefits of digital technology but also proactively addresses its social, ethical, and environmental implications.

In response to these challenges, post digital aesthetics offers a more flexible and critical perspective on digital transformation, challenging Ellul's view of technology as an autonomous force beyond human control (Gozzi, 2000; Vanderburg, 2012). While Ellul argues that technological development follows its own path (Lovasz, 2023), independent of human intervention, post digital aesthetics reframes technology as an evolving cultural artifact shaped by human interactions and societal values (Barbecho et al., 2023). Instead of seeing technology as something that dictates social structures, this approach acknowledges its entanglement with ethics, creativity, and cultural expression. It also dismantles the rigid separation between online and offline experiences, recognizing that digital spaces are not just tools for delivering content but dynamic environments that influence and are influenced by social realities (Sahni et al., 2024).

In education, for example, digital humanities illustrate how computational tools can be used to reinterpret cultural artifacts, expand academic inquiry, and develop critical digital literacy among students (Vodă et al., 2022; Widiyanto Santoso & Romadhon, 2021). Furthermore, incorporating local environmental resources into curricula enables educators to promote environmental literacy through hands-on, real-world learning experiences (Fauzi et al., 2021). The way energy consumption and technological use are discussed in classrooms influences how students perceive their role in environmental responsibility, embedding sustainable practices within broader social narratives (Rohman et al., 2024). These approaches not only enhance students' understanding of ecological issues but also encourage sustainable habits. Such integrative strategies, which combine post digital aesthetics with sustainability principles, allows educators to enhance digital skills, encourage innovative thinking, and cultivate a long-term awareness of environmental responsibility (Dhimas et al., 2024). In doing so, this approach fosters a generation that not only prioritizes ethical and sustainable technology use but also critically engages with the cultural narratives surrounding digital transformation (Oseghale, 2023).

Moreover, transformation initiatives that incorporate sustainability are more likely to create inclusive and culturally relevant educational practices. The active participation of teachers, parents, local communities, and policymakers is essential in selecting, implementing, and evaluating digital tools to ensure that technological progress benefits all while maintaining social responsibility (Wagener, 2021; Zhao et al., 2024). From a teaching perspective, combining digital transformation with sustainability fosters dynamic and engaging learning experiences. For example, project-based activities that integrate virtual simulations with hands-on tasks offer students a well-rounded (Dewi Asmia Sulistia Wirandini et al., 2024), immersive learning experience, helping them critically analyze how digital media shapes their understanding of the world (Elmore & Coleman, 2019; Fasting, 2022; Kerimbayev et al., 2020; Omran Zailuddin et al., 2024; Taylor, 2020). This blended approach highlights the importance of aligning digital tools with educational goals and ethical standards, ensuring that technology enhances rather than weakens human connections and cultural traditions.

This study addresses the research question: *How can digital tools be ethically and culturally integrated into education to promote sustainability and critical digital literacy?* It bridges theoretical perspectives with real-world challenges, contributing to discussions on digital transformation in education while supporting the Sustainable Development Goals

(SDGs). The research explores critical digital literacy, user-centered design, and sustainability for ethical and culturally relevant technological integration (Novikova, 2021; Tewksbury, 2015). Furthermore, the research emphasizes that digital initiatives should be designed with careful attention to power dynamics, representation, and sustainability from the outset (Khrapov & Baeva, 2022; Salmieri, 2019). Given that schools play a crucial role in shaping students' values, responsibilities, and long-term capabilities (Mikhaylovsky et al., 2021; Potts, 2017), this study contributes to a more comprehensive, ethical, and sustainable approach to the integration of digital tools in education.

Method

This study used a qualitative case study approach to examine the integration of post digital aesthetics, sustainability metrics, and social sustainability in a primary education setting (Lytras et al., 2024; Patterson & Agarwal, 2023). The researcher participated in school activities, observed classrooms, and engaged with participants to understand the implementation of digital and sustainability initiatives. The research was conducted at MI Narrative Quran, an Islamic primary school located in East Java, Indonesia. This school was purposively selected due to its active and innovative engagement in digital transformation, specifically its integration of adaptive learning technologies, collaborative platforms, and digital humanities within the framework of sustainability education. MI Narrative Quran stands out as a model for combining Islamic educational values with modern digital practices, making it a particularly rich and relevant site for exploring ethical and culturally contextualized digital education (Guillén-Gámez & Mayorga-Fernández, 2021).

The study involved sixteen purposively selected participants from MI Narrative Quran, including the principal (female, 58) for leadership insights, an administrator (male, 29) for operational and technical perspectives, and six teachers (Grades 1–6) who directly implemented digital and sustainability programs. Additionally, eight parents from diverse socioeconomic backgrounds (homemakers, civil servants, entrepreneurs) were included to represent family perspectives on student learning and home-school collaboration. This diverse composition ensured a well-rounded understanding of the implementation and impact of digital and sustainability initiatives. Data were collected over six months through semi-structured interviews, focus group discussions, and classroom observations (Thorne, 2005).

Data collection involved semi-structured interviews lasting thirty to sixty minutes, focusing on experiences with adaptive learning technologies, digital collaboration, and digital

humanities. Additionally, Focus Group Discussions (FGDs) were conducted with teachers, parents, and administrators to explore how digital transformation influenced teaching and learning. Teachers discussed instructional technology, parents shared insights into home-based digital learning, and administrators provided perspectives on the institutional implementation of digital tools and sustainability programs. The data analysis followed thematic coding using NVivo version 12, aligned with the Digital Competence Framework. (Di Vaio et al., 2024; Owoseni, 2023; Prihandono et al., 2024). The analysis proceeded through open coding to identify initial patterns, axial coding to group related concepts such as adaptive learning, digital literacy, energy conservation, and inclusive access, and thematic clustering to develop key dimensions of post digital aesthetics, sustainability metrics, and social sustainability, providing a comprehensive understanding of the intersection between digital innovation and sustainability in primary education.

Result and Discussion

Recent studies challenge Jacques Ellul's deterministic view of technology by emphasizing its role as a tool that can be intentionally designed with ethical and pedagogical aims in primary education. For instance, research on post digital learning spaces (Carvalho et al., 2024) highlights the creation of equitable and sustainable digital environments shaped by educators and communities. Similarly, studies on post digital literacies and pedagogic practices (Lacković et al., 2024) emphasize that digital interactions are influenced by ecological, relational, and socio material factors, positioning educators and students as active participants in shaping learning experiences. The concept of the post digital classroom further supports the idea that educational technologies are co-constructed by human and non-human agents rather than being autonomous forces (Forsler et al., 2024). Collectively, these studies reframed technology as a co-evolutionary process in which technology's impact is actively shaped by educators, students, and policymakers, fostering new forms of engagement, creativity, and cultural preservation rather than leading to the dehumanization of learning (Knyzelis, 2024).

Ellul warns of technocratic domination, where decisions are driven by technological efficiency rather than human values (Annas et al., 2024; Perspective, 2020). However, this study's focus on sustainability, including eco-friendly digital practices, paperless environments, and energy-efficient initiatives, illustrates that technology can be intentionally designed to align with social responsibility and environmental stewardship. The findings

reveal that digital education does not have to be purely mechanistic or efficiency-driven; instead, it can incorporate ethical considerations that prioritize inclusivity, ecological awareness, and community engagement. Contrary to Ellul's assertion that individuals are powerless against technological progression, this study suggests that educational institutions can exercise agency by designing digital ecosystems that balance technological innovation with sustainable and equitable learning environments.

Moreover, this study challenges Ellul's notion of an irreversible technological path by demonstrating that digital tools can be adapted to specific socio-cultural contexts. For example, in one project, students created multimedia biographies of local historical Pictures, incorporating regional cultural narratives, which highlighted how digital tools can be tailored to enhance cultural relevance. Findings on digital humanities integration and narrative-driven pedagogy indicate that technology does not necessarily replace traditional educational values but enriches them. Students' engagement with interactive historical narratives, multimedia biographies, and interdisciplinary projects illustrates how digital technologies can enhance critical thinking and cultural literacy rather than diminish them. This supports the argument that technology should not be seen as an isolated system imposing structural changes but as a flexible, participatory medium that can be adjusted to reinforce societal values.

These findings of this study are structured around the conceptual framework presented in Figure 1, which integrates the principles of post digital aesthetics and sustainability in the context of primary education.

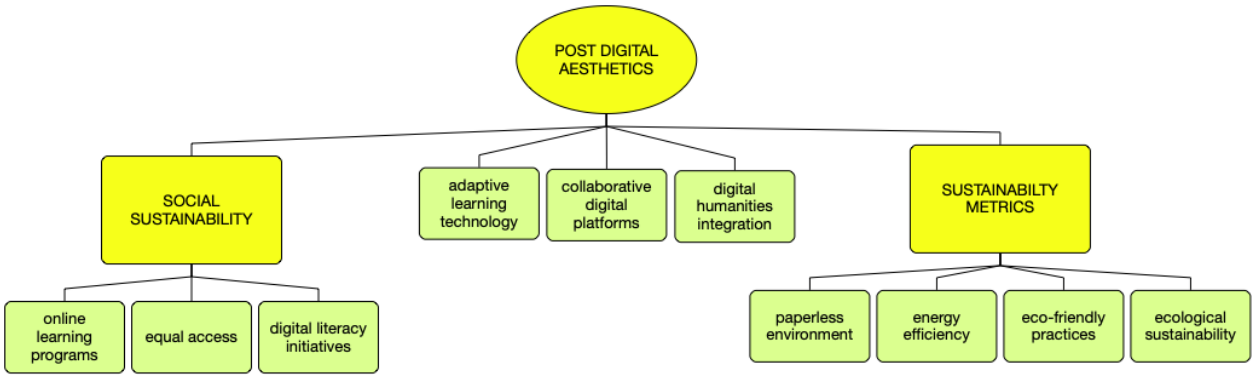

Figure 1. Conceptual framework integrating postdigital aesthetics and sustainability in primary education

Figure 1 illustrates how post digital aesthetics supports a hybrid approach to technology, linking physical and digital realities while addressing social and ecological sustainability. The section is divided into two main domains: Social Sustainability and

Sustainability Metrics. Cultural narratives are central to the Social Sustainability domain, ensuring that digital transformation is socially inclusive and culturally relevant by reflecting local values and traditions. The Sustainability Metrics domain focuses on evaluating the long-term ecological and social benefits of these digital strategies, providing a comprehensive view of the opportunities and challenges in implementing digital transformation in primary education.

Table 1. Distribution of Coding References

Node (Theme)	Sub-node (Details)	Coding References
Postdigital Aesthetics	Adaptive Learning Technologies	49
	Collaborative Digital Platforms	36
	Digital Humanities Integration	43
Sustainability Metrics	Ecological Sustainability	39
	Energy Efficiency	26
	Paperless Environment	24
	Eco-friendly Practices	38
Social Sustainability	Online Learning Programs	46
	Digital Literacy Initiatives	49

Table 1 presents the distribution of coding references across key themes in post digital aesthetics and sustainability within primary education. The highest emphasis appears in Adaptive Learning Technologies and Digital Literacy Initiatives (49 references each), underscoring the importance of personalized learning and digital skills. Online Learning Programs (46 references) further reflect the role of digital platforms in promoting access and inclusivity. In terms of sustainability, Ecological Sustainability (39 references) and Eco-friendly Practices (38 references) show significant attention, while Energy Efficiency (26) and Paperless Environments (24) demonstrate ongoing environmental efforts. Moderate attention to Collaborative Digital Platforms (36) and Digital Humanities Integration (43) points to a growing value placed on interdisciplinary and cooperative learning. Overall, the findings highlight the need to align digital innovation with environmental responsibility and social equity to support inclusive and sustainable educational transformation.

a. Adaptive Learning Technologies

The integration of adaptive learning technologies has significantly enhanced personalized education in primary schools. These tools enable students to progress at their own pace, catering to their diverse learning needs. Interactive applications focusing on literacy and numeracy, particularly for Grades 1 and 2, have proven effective in keeping younger students engaged through real-time feedback and adaptive difficulty levels. For older students, history-oriented tools tailored for exam preparation have been instrumental

in improving understanding of complex topics. The use of adaptive learning platforms was coded 49 times in the data, reflecting its significance in the academic experience. As one educator noted, *"These platforms allowed students to progress at their own pace, ensuring that slower learners could catch up without feeling left behind."*

Picture 1. Upgrading Skills of Teachers

This Picture 1 highlights efforts to enhance teachers' skills through professional development, showing educators engaged in workshops and using technology and collaborative platforms to improve their teaching methods and integrate adaptive learning technologies. Adaptive learning technologies effectively address diverse learning needs by personalizing content based on student profiles. Using data analytics and machine learning, these tools allow students to progress at their own pace (Haase, 2019; van den Berg & de Villiers, 2021). Applications that track performance and offer tailored feedback have been shown to improve engagement and comprehension, especially for marginalized students facing barriers in traditional classrooms (Kearns et al., 2020; Zibin et al., 2023).

However, the study also identified challenges in implementing these technologies, including unequal access to devices and connectivity. Despite efforts to bridge the digital divide, schools in remote or economically disadvantaged regions continue to face significant barriers, limiting the reach and effectiveness of adaptive tools (Hussain & Brown, 2024). Addressing these disparities is essential to ensuring that adaptive learning technologies contribute to broader goals of social equity and inclusion.

b. Collaborative Digital Platforms

The integration of collaborative digital platforms such as Google Workspace and Microsoft Teams has significantly enhanced student collaboration, especially for project-based learning. While these platforms facilitate effective peer interaction and engagement, younger students often require additional guidance to navigate the tools, emphasizing the need for age-appropriate interfaces and parental involvement. Collaborative platforms transcend geographical and temporal barriers, enabling students and educators to work

together using shared virtual whiteboards, discussion forums, and project-based learning applications (Jardim, 2021; Nee, 2019). This aligns with post digital aesthetics by blending digital tools with physical collaboration, creating hybrid learning environments that enrich traditional educational methods (Campbell, 2016). This Picture 2 depicts students actively engaging with collaborative digital tools such as Google Workspace and Microsoft Teams, especially in project-based learning for Grades 4 to 6.

Picture 2. Students Using Collaborative Digital Platforms

As one teacher shared, *"Collaborative platforms allowed me to stay connected with parents and students, ensuring a cohesive approach to education, especially during remote learning*". This feedback reflects how these platforms improve teacher-parent communication while fostering inclusive learning environments (Abraham, 2023; Illi et al., 2024). Additionally, collaborative platforms promote inclusivity by enabling group work and peer feedback, helping engage students who face difficulties with traditional instructional methods. These platforms also enhance teacher professional development by providing access to global networks and resources, supporting continuous learning (Blakeman et al., 2020; Lapolla & Copeland, 2023; Zhang, 2025).

However, concerns about data privacy and security remain significant challenges, particularly with platforms managed by large corporations. Addressing these issues through strong governance frameworks and locally informed strategies is crucial to maximizing the benefits of collaborative digital platforms in primary education (Petralia & Ciliberti, 2023; Thomas, 2024).

c. Digital Humanities Integration

The integration of digital tools in teaching humanities subjects like history and literature has fostered creativity and critical thinking among students. In a Grade 6 project, students created multimedia biographies of historical Pictures, blending textual research with visual storytelling. This method received 43 coding references, underscoring the

potential of digital humanities to reshape students' engagement with cultural narratives (Belyak, 2021; Guo & Qiu, 2024). By incorporating digital tools, students not only develop digital literacy but also gain deeper insights into historical and cultural contexts through creative expression

Picture 3. Collaborative Narrative Culture Games

The use of digital humanities in primary education marks a significant shift in how students engage with cultural artifacts and historical narratives. Computational tools allow students to analyze texts, images, and cultural materials, fostering critical thinking and interdisciplinary learning (Saryazdi et al., 2022). For example, tools that visualize historical data or create digital timelines enhance students' understanding of complex subjects. These innovations bridge the gap between traditional literacy and digital literacy, expanding students' cognitive and interpretive skills (Sun et al., 2022).

However, the study reveals that effectively incorporating digital humanities into the curriculum requires adequate teacher training. Many educators lack the technical skills and confidence needed to use these tools effectively. This highlights the importance of professional development programs that align with the principles of post digital aesthetics, ensuring that teachers are equipped to integrate digital humanities into their teaching practices (Xie et al., 2022). Training initiatives will empower educators to enhance their students' learning experiences, making digital tools a meaningful part of the curriculum.

d. Paperless Environments

The transition to paperless environments in primary education has yielded significant benefits, including reduced resource consumption and streamlined administrative processes. Digital tools such as e-books, online assessments, and cloud-based storage have replaced traditional paper-based systems, aligning with sustainability goals (Foster, 2023; Saurabh et al., 2022)**.** However, this shift also presents challenges, particularly in ensuring that digital tools are accessible and user-friendly for both students and educators. The study found that schools with limited infrastructure or training resources often face

difficulties in implementing paperless systems effectively (Panda et al., 2023; Wang & Keane, 2020). Addressing these barriers requires targeted investments in digital infrastructure and capacity-building initiatives.

Interviews with teachers, students, and administrators highlighted both the advantages and challenges of this transition. Many parents appreciated the environmental benefits but expressed concerns about missing printed materials for review. One parent noted, *"It's good for the environment, but I miss having printed homework to review,"* while another added, *"It's efficient, but some parents might struggle with technology."* Some educators emphasized the need for balance, with one stating, *"It's a positive step, but I think it's important to strike a balance with traditional methods."*

Teachers shared various strategies for managing class activities in a paperless format. A Grade 1 teacher explained, *"We use tablets for drawing and simple quizzes, which reduces paper use,"* while a Grade 3 teacher noted, *"Students use e-books and submit assignments digitally to minimize paper waste."* At higher levels, educators incorporated more advanced tools, such as online research projects and fully digital exams, to maintain a seamless transition. School administrators highlighted that a gradual transition, combined with training and consistent communication with stakeholders, was essential to overcoming resistance. *"We introduced digital tools like Google Classroom for assignments and exams while providing hands-on support for teachers, students, and parents,"* explained one school leader. Platforms such as Google Workspace and Microsoft Teams were identified as particularly effective in reducing paper usage. Additionally, schools reported significant cost savings and increased efficiency in administrative processes.

e. Energy Efficiency

Energy efficiency emerged as a key focus, with schools adopting measures such as LED lighting and motion-sensor systems. These initiatives reduced operational costs and provided educational opportunities. For instance, Grade 6 students conducted energy patrols, reinforcing their understanding of responsible energy consumption One parent remarked, *"Seeing my child participate in energy patrols has encouraged our family to adopt similar habits at home, like turning off unused appliances and lights, creating a more energy-conscious environment for everyone."* However, the high upfront costs of energy-efficient technologies pose a barrier to wider adoption.

Despite these advantages, challenges remain in promoting widespread adoption of energy-efficient practices. High initial costs and limited awareness among stakeholders

often hinder the implementation of sustainable technologies. The findings underscore the importance of policy interventions and incentive programs to support schools in adopting energy-efficient solutions (Christensen & Rommes, 2019).

Energy efficiency emerged as a critical consideration in the sustainable integration of digital technologies. The study highlights the potential of energy-efficient devices and practices, such as the use of low-power hardware and optimized software, to reduce the environmental impact of digital transformation (Merchant et al., 2024). Schools that adopted energy-efficient technologies reported significant reductions in operational costs, demonstrating the dual benefits of sustainability and economic efficiency.

f. Eco-Friendly Practices

Eco-friendly practices were integrated into the educational framework through activities such as waste segregation, tree planting, and competitions promoting recycling. These initiatives fostered environmental awareness among students and the wider community. Teachers also encouraged students to adopt habits like using reusable containers, instilling an eco-conscious mindset.

Interview notes revealed that proactive leadership was instrumental in embedding eco-friendly practices within the school culture. One school administrator stated, *"Our leadership team prioritizes sustainability by modeling green behaviors and actively engaging with both staff and students in these initiatives."* This perspective is consistent with findings that highlight the role of leadership in driving environmentally responsible practices at the institutional level(Lindell, 2024).

Furthermore, integrating sustainability into science, social studies, and Islamic studies lessons significantly enhanced student engagement and comprehension of ecological and ethical issues. For instance (Picture 3), lessons on recycling processes, renewable energy sources, and the Islamic principle of stewardship (*khalifa*) were accompanied by hands-on activities, such as creating compost bins, designing small solar-powered devices, and discussing the ethical responsibility of caring for Allah’s creation. These practices helped students connect ecological awareness with spiritual values, fostering a holistic understanding of sustainability. Schools also introduced activities like Eco-Waqf projects, where students planted trees as part of a charitable initiative, reinforcing the integration of religious teachings with ecological practices.

Picture 4: Recycling progam

These activities align with research suggesting that incorporating sustainability topics into the curriculum can deepen students' understanding and foster long-term ecological awareness (Petrova, 2022). Additionally, the proactive involvement of leadership teams in embedding these initiatives underscores their role in creating a culture of sustainability at the institutional level (Barton & Gutiérrez-Antinopai, 2020; Othman & Ameer, 2024).

g. Ecological Sustainability

The integration of ecological sustainability initiatives into the school curriculum yielded significant results. Programs such as recycling, composting, and tree planting were consistently implemented across grade levels. For example, Grade 6 students analyzed the school's energy consumption and proposed strategies for improvement. These initiatives align with findings that emphasize the role of education in fostering environmental stewardship (Řeřicha & Práger, 2021).

One significant accomplishment was the adoption of paperless environments, which led to a 30% decrease in paper usage and an annual saving of over 8,000 sheets per year. The principal highlighted this achievement during an interview, stating, "*Transitioning to digital systems has not only helped us reduce waste but has also significantly streamlined administrative processes, making daily operations more efficient and environmentally friendly*." These practices not only reduced resource usage but also aligned with broader sustainability goals. Interview notes revealed that teachers highlighted the ease and efficiency of managing digital assignments, with one teacher noting, *"Using e-books and digital submissions has not only saved paper but also streamlined grading and feedback processes."* However, despite these successes, parental involvement in ecological initiatives remained inconsistent, highlighting the need for community engagement.

This finding aligns with research emphasizing the importance of aligning sustainability goals with technological integration (Abraham, 2023; Smith, 2024). Addressing infrastructure and training challenges is essential to fully realize the benefits of transitioning to paperless systems (Fernández-Portillo et al., 2019).

h. Online Learning Program

Online learning programs emerged as a pivotal strategy for improving educational access, particularly for students in rural and economically disadvantaged areas. By providing digital platforms and resources, the school addressed barriers such as geographical isolation and financial constraints. These initiatives were supported by 46 coding references related to online learning, highlighting their effectiveness in facilitating academic participation and reducing social isolation. For example, the use of recorded lessons and flexible schedules allowed students to revisit materials at their own pace, ensuring that education continued uninterrupted during disruptions like the COVID-19 pandemic (Acciarini et al., 2021; Antón-Sancho et al., 2024; Krelová et al., 2021). As one parent shared during an interview, "*Having recorded lessons meant my child could keep up with school even when our internet connection was unreliable. It gave us the flexibility to adapt learning to our daily challenges."*

The principal emphasized the transformative impact of these programs, stating, "*Online learning has opened doors to educational opportunities that were previously inaccessible, particularly for our students in remote areas."* A teacher also highlighted the benefits, noting, "*The flexibility of recorded lessons ensures that no student is left behind, even when they face connectivity issues or personal challenges."* Similarly, a parent shared, *"Online learning has allowed my child to continue their education even when transportation was a challenge. It's reassuring to know they are not missing out on opportunities."*

These findings align with prior literature emphasizing the role of online learning in promoting equity in education. Research suggests that online platforms can significantly enhance access to quality education for marginalized groups, addressing long-standing disparities in educational opportunities (J.-H. Choi & Kim, 2020; Krelová et al., 2022).

i. Equal Access

Efforts to ensure equal access included device-sharing programs and subsidized internet packages, allowing students from lower-income households to participate in online learning. Flexible schedules and recorded lessons further supported students facing connectivity challenges, enabling them to engage with educational materials at their own pace. For example, one parent noted during a focus group discussion, *"The recorded*

lessons have been a lifesaver for my child, especially when internet connectivity was unreliable. We could access the lessons at convenient times, ensuring continuity in learning."

These initiatives helped bridge the digital divide to some extent, particularly during the pandemic. However, barriers such as inconsistent internet connectivity, limited availability of devices, and a lack of digital literacy among parents persisted, particularly in rural areas. These challenges reflect broader issues highlighted in the literature, where the digital divide exacerbates existing social inequalities and limits the reach of technological advancements in education (Montenegro-Rueda et al., 2023).

Teachers also played a pivotal role in mitigating access disparities by designing offline tasks and providing printed materials for students without reliable internet connections. As one teacher shared, *"Creating printed assignments and ensuring they reached students who couldn't access online platforms was a challenge, but it was necessary to ensure no one was left behind."* These efforts aligned with research advocating for user-centered approaches in education, emphasizing the importance of ensuring that no student is excluded due to technological barriers (Passantino, 2021; Potts, 2017; Saltos-Rivas et al., 2022).

Despite these commendable efforts, achieving true equal access remains a complex challenge. Schools must collaborate with policymakers, non-governmental organizations, and the private sector to secure funding for infrastructure improvements, including widespread internet connectivity and affordable device distribution. Moreover, integrating digital literacy programs for parents can empower families to better support their children's education, fostering a more inclusive learning environment.

j. Digital Literacy Initiatives

Digital literacy initiatives were instrumental in equipping students with essential skills to navigate digital environments. Alongside the online learning programs, the school implemented initiatives to ensure that students, particularly those from marginalized backgrounds, could engage effectively with the available technology. These programs were designed to equip students with the essential skills needed to navigate digital environments, engage with online content, and use technology responsibly. For example, Grade 5 students engaged in blog creation projects, which improved their technical and writing skills. These initiatives received 49 coding references, reflecting their impact on fostering social equity.

One educator remarked, "*The digital literacy initiatives have been transformative. It's not just about using technology but ensuring everyone has the skills to do so effectively."* This aligns with research emphasizing the importance of critical digital literacy in empowering learners to engage responsibly with technology (Bulger et al., 2023; Dezuanni, 2021; Molinaro et al., 2021). Teachers highlighted that these programs prepared students for a technology-driven future by introducing skills progressively, starting with basic navigation for younger students and advancing to collaborative projects and research for older ones.

Parental involvement was identified as crucial for the success of these initiatives. Many parents expressed a need for training programs to better support their children's digital education at home. As one parent noted during a focus group discussion, *"Understanding how to use the platforms my child works with has helped me guide them better, especially when they face technical difficulties."*

The success of these initiatives lies not only in introducing students to technology but in empowering them with the skills necessary to use it effectively and responsibly. This was particularly important for leveling the playing field for students from marginalized communities, allowing them to compete on equal terms with their peers.

These findings are consistent with literature suggesting that digital literacy programs can significantly enhance social equity by providing marginalized groups with the tools and knowledge they need to navigate the increasingly digital world. Studies show that such initiatives improve academic outcomes and promote long-term success for students, particularly those from disadvantaged backgrounds (Guillén-Gámez et al., 2022; Leung & Bentley, 2017; Yang et al., 2023). By focusing on digital literacy, the school contributed to reducing the digital divide and fostering social sustainability by ensuring that all students, regardless of socio-economic background, had the opportunity to thrive in a digital environment.

Conclusion

This study challenges Jacques Ellul's deterministic view of technology as autonomous and irreversible, showing instead that digital education is a flexible tool shaped by ethical, social, and cultural values. Rather than prioritizing efficiency alone, digital transformation in education is actively influenced by educators, policymakers, and learners to promote inclusion, sustainability, and cultural preservation. Thoughtful integration of technology can support Sustainable Development Goals by expanding access to inclusive

and equitable learning. The findings emphasize that ethical digital practices are essential for building socially responsible and empowering educational environments.

Suggestion

These insights underscore the need to align digital education with broader sociocultural values, ensuring that technology advances not only efficiency but also social integration, cultural preservation, and global citizenship. This approach supports the Sustainable Development Goals, especially Goal 4, Goal 10, and Goal 16, by promoting equitable access, cultural diversity, and inclusive societies. Future research should explore how digital education models can be adapted across various contexts to deepen understanding of digital literacy and cultural narratives in advancing social sustainability.

References

Abraham, S. (2023). Your Sustainability Is Not My Sustainability: In-between Spaces for Meaningful Collaboration between Local Stakeholders and Planning Professionals to Construct Congruent Frames over Contested Meanings. *Sustainability (Switzerland)*, *15*(19). https://doi.org/10.3390/su151914179

Acciarini, C., Boccardelli, P., & Vitale, M. (2021). Resilient companies in the time of Covid-19 pandemic: a case study approach. *Journal of Entrepreneurship and Public Policy*, *10*(3), 336–351. https://doi.org/10.1108/JEPP-03-2021-0021

Annas, M. K., Mufid, W., Yani, M. T., Suprijono, A., Jefferi, M., & Mat, H. (2024). Integration of Noble Values in Tiban Art in Transformative Social Studies Learning. *ENTITA: Jurnal Pendidikan Ilmu Pengetahuan Sosial Dan Ilmu-Ilmu Sosial*, *6*(2). https://doi.org/10.19105/ejpis.v6i2.14123

Antón-Sancho, Á., Fernández-Arias, P., Lampropoulos, G., & Vergara, D. (2024). Influential academic factors in the integration of ICT in higher education after the COVID-19 pandemic. *Journal of Infrastructure, Policy and Development*, *8*(12). https://doi.org/10.24294/jipd.v8i12.5089

Barbecho, L. B., Muñoz, S. R., García, E. G.-B., & Toscano, M. (2023). Digital humanities at global scale. *Interdisciplinary Science Reviews*, *48*(3), 446–459. https://doi.org/10.1080/03080188.2023.2193799

Barton, J. R., & Gutiérrez-Antinopai, F. (2020). Towards a visual typology of sustainability and sustainable development. *Sustainability (Switzerland)*, *12*(19). https://doi.org/10.3390/SU12197935

Bedford-Strohm, H. (2020). The Ethical Challenges of the Digital Age: Between Promises of Salvation and Prophecies of Doom. *Ecumenical Review*, *72*(2), 167–182. https://doi.org/10.1111/erev.12499

Belyak, G. N. (2021). On potential development strategies for Digital Humanities. *Voprosy Literatury*, *4*, 70–94. https://doi.org/10.31425/0042-8795-2021-4-70-94

Blakeman, R., Haley, E., & Taylor, M. (2020). Interagency Collaboration: Account and Creative Teams Speak Out About Their Relationship. *Journal of Advertising Education*, *24*(1), 52–68. https://doi.org/10.1177/1098048220914006

Bulger, M., Baleria, G., Hobbs, R., & Moffitt, K. R. (2023). The promise of media literacy education when “everything is at stake” and “everything is expected.” *Journal of Media Literacy Education*, *15*(1), 99–108. https://doi.org/10.23860/JMLE-2023-15-1-8

Campbell, H. A. (2016). Framing the human-technology relationship: How Religious Digital Creatives engage posthuman narratives. *Social Compass*, *63*(3), 302–318. https://doi.org/10.1177/0037768616652328

Carvalho, L., Czerniewicz, L., & Lamb, J. (2024). Positive, Postdigital Spaces for Learning. *Postdigital Science and Education*, *6*(4), 1334–1349. https://doi.org/10.1007/s42438-024-00523-y

Choi, E., & Park, N. (2022). IT Humanities Education Program to Improve Digital Literacy of the Elderly. *Journal of Curriculum and Teaching*, *11*(5), 138–145. https://doi.org/10.5430/JCT.V11N5P138

Choi, J.-H., & Kim, Y.-R. (2020). Communication of nonverbal students with severe and multiple disabilities: A systematic scoping review. *Korean Journal of Physical, Multiple and Health Disabilities*, *63*(1), 66–94. https://doi.org/10.20971/KCPMD.2020.63.1.65

Christensen, T. H., & Rommes, E. (2019). Don't blame the youth: The social-institutional and material embeddedness of young people's energy-intensive use of information and communication technology. *Energy Research and Social Science*, *49*, 82–90. https://doi.org/10.1016/j.erss.2018.10.014

David Webster, M. (2017). Philosophy of Technology Assumptions in Educational Technology Leadership. In *Educational Technology & Society* (Vol. 20, Issue 1).

Dewi Asmia Sulistia Wirandini, Nurhidayati, H., Sari, D. A. K., Bayu Segara, N., & Ningrawati, T. (2024). Penerapan Model Pembelajaran Kooperatif Tipe Jigsaw untuk Meningkatkan Kolaborasi Peserta Didik pada Mata Pelajaran IPS. *Entita: Jurnal Pendidikan Ilmu Pengetahuan Sosial Dan Ilmu-Ilmu Sosial*, *6*(1), 87–104. https://doi.org/10.19105/ejpis.v6i1.13545

Dezuanni, M. (2021). Re-visiting the Australian Media Arts curriculum for digital media literacy education. *Australian Educational Researcher*, *48*(5), 873–887. https://doi.org/10.1007/s13384-021-00472-6

Dhimas, A. M., Ilman, A. M., & Utami, L. (2024). Integrating Local Environmental Resources into Social Studies Curriculum: A Case Study of Primary Education in Enhancing Environmental Literacy. *IJTIMAIYA: Journal of Social Science and Teaching*, *8*(2). https://doi.org/10.21043/ji.v8i2.29113

Di Vaio, A., Latif, B., Gunarathne, N., Gupta, M., & D'Adamo, I. (2024). Digitalization and artificial knowledge for accountability in SCM: a systematic literature review. *Journal of Enterprise Information Management*, *37*(2), 606–672. https://doi.org/10.1108/JEIM-08-2022-0275

El Hilali, W., El Manouar, A., & Janati Idrissi, M. A. (2020). Reaching sustainability during a digital transformation: a PLS approach. *International Journal of Innovation Science*, *12*(1), 52–79. https://doi.org/10.1108/IJIS-08-2019-0083

Elmore, P. G., & Coleman, J. M. (2019). Middle School Students' Analysis of Political Memes to Support Critical Media Literacy. *Journal of Adolescent and Adult Literacy*, *63*(1), 29–40. https://doi.org/10.1002/jaal.948

Fasting, M. (2022). Habit and Doubt in the Classroom: Everyday Media Literacy in a Norwegian Upper Secondary School: Visuality Design in and for Education. *Video Journal of Education and Pedagogy*, *10*(2). https://doi.org/10.1163/23644583-bja10034

Fauzi, L., Prasetyo, K., & Haidar, M. A. (2021). The Influence of Jodipan Color Utilization as a Learning Source of Ability to Solve Problems in The Theme of Enviromental Pollution. *ENTITA: Jurnal Pendidikan Ilmu Pengetahuan Sosial Dan Ilmu-Ilmu Sosial*, *3*(2), 185–196. https://doi.org/10.19105/ejpis.v3i2.4956

Fernández-Mateo, J., & Franco-Barrera, A. J. (2020). Animal Welfare for Corporate Sustainability: The Business Benchmark on Farm Animal Welfare. *Journal of Sustainability Research*, *2*(3). https://doi.org/10.20900/jsr20200030

Fernández-Portillo, A., Almodóvar-González, M., Coca-Pérez, J. L., & Jiménez-Naranjo, H. V. (2019). Is sustainable economic development possible thanks to the deployment of ICT? *Sustainability (Switzerland)*, *11*(22). https://doi.org/10.3390/su11226307

Forsler, I., Bardone, E., & Forsman, M. (2024). The Future Postdigital Classroom. *Postdigital Science and Education*. https://doi.org/10.1007/s42438-024-00488-y

Foster, C. L. E. (2023). Truth as social practice in a digital era: iteration as persuasion. *AI and Society*, *38*(5), 2009–2023. https://doi.org/10.1007/s00146-021-01306-w

Gomez-Trujillo, A. M., & Gonzalez-Perez, M. A. (2022). Digital transformation as a strategy to reach sustainability. *Smart and Sustainable Built Environment*, *11*(4), 1137–1162. https://doi.org/10.1108/SASBE-01-2021-0011

Gozzi, R. (2000). Jacques Ellul on technique, media, and the spirit. *New Jersey Journal of Communication*, *8*(1), 79–90. https://doi.org/10.1080/15456870009367380

Guillén-Gámez, F. D., Cabero-Almenara, J., Llorente-Cejudo, C., & Palacios-Rodríguez, A. (2022). Differential Analysis of the Years of Experience of Higher Education Teachers, their Digital Competence and use of Digital Resources: Comparative Research Methods. *Technology, Knowledge and Learning*, *27*(4), 1193–1213. https://doi.org/10.1007/s10758-021-09531-4

Guillén-Gámez, F. D., & Mayorga-Fernández, M. J. (2021). Design and validation of an instrument of self-perception regarding the lecturers' use of ICT resources: to teach, evaluate and research. *Education and Information Technologies*, *26*(2), 1627–1646. https://doi.org/10.1007/s10639-020-10321-1

Guo, W., & Qiu, L. (2024). Constructing extraordinary experience from everyday life: Zibo barbecue check-in vlogs' digital narratives. *Tourist Studies*. https://doi.org/10.1177/14687976241281777

Haase, F.-A. (2019). "presentation" and "representation" of contents as principles of media convergence: A model of rhetorical narrativity of interactive multimedia design in mass communication with a case study of the digital edition of the New York Times. *Semiotica*, *2019*(226), 89–106. https://doi.org/10.1515/sem-2017-0048

Hussain, F., & Brown, S. (2024). ICT tools for addressing mobility needs of Rohingya refugees with disabilities: practical challenges and solutions. *Information Technology for Development*, *30*(4), 644–664. https://doi.org/10.1080/02681102.2024.2327864

Illi, M., Gustafsson, R., & Masoodian, M. (2024). Visual metaphors for collaboration planning in strategy meetings. *Journal of Strategy and Management*, *17*(4), 781–801. https://doi.org/10.1108/JSMA-05-2024-0089

Jardim, J. (2021). Entrepreneurial skills to be successful in the global and digital world: Proposal for a frame of reference for entrepreneurial education. *Education Sciences*, *11*(7). https://doi.org/10.3390/educsci11070356

Kearns, Á., Kelly, H., & Pitt, I. (2020). Rating experience of ICT-delivered aphasia rehabilitation: co-design of a feedback questionnaire. *Aphasiology*, *34*(3), 319–342. https://doi.org/10.1080/02687038.2019.1649913

Kerimbayev, N., Nurym, N., Akramova, A., & Abdykarimova, S. (2020). Virtual educational environment: interactive communication using LMS Moodle. *Education and Information Technologies*, *25*(3), 1965–1982. https://doi.org/10.1007/s10639-019-10067-5

Khrapov, S. A., & Baeva, L. V. (2022). Digitalization of Educational Space: Emotional Risks and Effects. *Voprosy Filosofii*, *2022*(4), 16–24. https://doi.org/10.21146/0042-8744-2022-4-16-24

Knyzelis, M. (2024). The Philosophical Aspect of Contemporary Technology: Ellulian Technique and Infinite Scroll within Social Media. *Filosofija, Sociologija*, *35*(1), 31–39. https://doi.org/10.6001/fil-soc.2024.35.1.5

Krelová, K. K., Berková, K., Krpálek, P., & Kubišová, A. (2021). Attitudes of Czech college students toward digital literacy and their technical aids in times of COVID-19. *International Journal of Engineering Pedagogy*, *11*(44), 130–147. https://doi.org/10.3991/IJEP.V11I4.20821

Krelová, K. K., Berková, K., Krpálek, P., & Kubišová, A. (2022). Perception of Selected Aspects of Online Learning by Czech Higher Education Students. *International Journal of Engineering Pedagogy*, *12*(5), 4–25. https://doi.org/10.3991/ijep.v12i5.32243

Lacković, N., Olteanu, A., & Campbell, C. (2024). Postdigital Literacies in Everyday Life and Pedagogic Practices. *Postdigital Science and Education*. https://doi.org/10.1007/s42438-024-00500-5

Lapolla, K., & Copeland, L. (2023). Industry scenarios in the classroom: A case for design and merchandising student collaboration. *International Journal of Fashion Design, Technology and Education*, *16*(3), 266–274. https://doi.org/10.1080/17543266.2023.2173310

Leung, L., & Bentley, N. (2017). Producing Leisured Laborers: Developing Higher Education Courses for the Digital Creative Industries. *Journal of Arts Management Law and Society*, *47*(2), 148–160. https://doi.org/10.1080/10632921.2016.1259133

Lindell, R. (2024). The dialectics of digitalisation: A critique of the modernistic imperative for the development of digital technology. *Futures*, *162*. https://doi.org/10.1016/j.futures.2024.103428

Litterio, L. M. (2020). Digital Humanities in Professional and Technical Communication: Results of a Pedagogical Pilot Study. *Technical Communication Quarterly*, 77–88. https://doi.org/10.1080/10572252.2020.1789744

Lovasz, A. (2023). Niklas Luhmann and Jacques Ellul on the autonomy of technology. *Kybernetes*. https://doi.org/10.1108/K-02-2023-0287

Lytras, M. D., Serban, A. C., Alkhaldi, A., Aldosemani, T., & Malik, S. (2024). Digital Transformation in Higher Education in Times of Artificial Intelligence: Setting the Emerging Landscape. In M. D. Lytras, A. C. Serban, A. Alkhaldi, S. Malik, & T. Aldosemani (Eds.), *Digital Transformation in Higher Education, Part A* (pp. 1–22). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83549-480-620241001

Merchant, P. R., Pitman, T., & King, E. (2024). Navigating Physical and Digital Environments: Latin American Video Game Studies in Practice. *Bulletin of Latin American Research*, *43*(3), 263–276. https://doi.org/10.1111/blar.13578

Mikhaylovsky, M. N., Karavanova, L. Z., Medved, E. I., Deberdeeva, N. A., Buzinova, L. M., & Zaychenko, A. A. (2021). The Model of STEM Education as an Innovative Technology in the System of Higher Professional Education of the Russian Federation. *Eurasia Journal of Mathematics, Science and Technology Education*, *17*(9), 1–11. https://doi.org/10.29333/ejmste/11173

Molinaro, M. L., Cheng, A., Cristancho, S., & LaDonna, K. (2021). Drawing on experience: exploring the pedagogical possibilities of using rich pictures in health professions education. *Advances in Health Sciences Education*, *26*(5), 1519–1535. https://doi.org/10.1007/s10459-021-10056-9

Montenegro-Rueda, M., Fernández-Batanero, J. M., & Fernández-Cerero, J. (2023). Impact of ICT on university students with visual impairment. *British Journal of Special Education*, *50*(1), 28–48. https://doi.org/10.1111/1467-8578.12433

Nee, R. C. (2019). Youthquakes in a Post-Truth Era: Exploring Social Media News Use and Information Verification Actions Among Global Teens and Young Adults. *Journalism and Mass Communication Educator*, *74*(2), 171–184. https://doi.org/10.1177/1077695818825215

Novikova, E. Yu. (2021). Emotions in the electronic educational space. *Vysshee Obrazovanie v Rossii*, *30*(6), 108–119. https://doi.org/10.31992/0869-3617-2021-30-6-108-119

Omran Zailuddin, M. F. N., Nik Harun, N. A., Abdul Rahim, H. A., Kamaruzaman, A. F., Berahim, M. H., Harun, M. H., & Ibrahim, Y. (2024). Redefining creative education: a case study analysis of AI in design courses. *Journal of Research in Innovative Teaching & Learning*, *17*(2), 282–296. https://doi.org/10.1108/JRIT-01-2024-0019

Oseghale, O. (2023). Digital information literacy skills and use of electronic resources by humanities graduate students at Kenneth Dike Library, University of Ibadan, Nigeria. *Digital Library Perspectives*, *39*(2), 181–204. https://doi.org/10.1108/DLP-09-2022-0071

Othman, R., & Ameer, R. (2024). Rethinking accounting education for a sustainable future: charting a course for sustainable development goals 2030. *Meditari Accountancy Research*, *32*(5), 1809–1836. https://doi.org/10.1108/MEDAR-05-2023-2009

Owoseni, A. (2023). What is digital transformation? Investigating the metaphorical meaning of digital transformation and why it matters. *Digital Transformation and Society*, *2*(1), 78–96. https://doi.org/10.1108/DTS-10-2022-0049

Panda, A., Pasumarti, S. S., & Hiremath, S. (2023). Flourishing digital technology in professional services firms: multidisciplinary perspectives in India. *Journal of Service Theory and Practice*, *33*(2), 198–216. https://doi.org/10.1108/JSTP-06-2022-0131

Passantino, F. (2021). Reflections: diversity, inclusion and belonging in education Post-Covid. *Intercultural Education*, *32*(5), 583–589. https://doi.org/10.1080/14675986.2021.1857575

Patterson, E., & Agarwal, R. (2023). Reducing the gap between rhetoric and reality: Use of Digital Service Standards for public service innovation through digital transformation in Australia. *Australian Journal of Public Administration*, *82*(4), 557–589. https://doi.org/10.1111/1467-8500.12615

Perspective, A. E. (2020). *Technology, Knowledge, and Society Technique and the Sociotechnological Phenomenon of Artificial Intelligence*. https://doi.org/10.18848/1832-3669/CGP

Petralia, P., & Ciliberti, R. (2023). An ethical challenge: Towards digital healthcare. *Medicina Historica*, *7*(3). https://www.scopus.com/inward/record.uri?eid=2-s2.0-85183098471&partnerID=40&md5=d1aeba289b71e3aa999ec9649042e560

Petrova, E. V. (2022). Ecology of the Digital Environment as an Attempt to Respond to the Civilizational Challenges of the Digital Age. *Voprosy Filosofii*, *2022*(11), 99–109. https://doi.org/10.21146/0042-8744-2022-11-99-109

Potts, R. (2017). Design Education at the Boundary. *Design Journal*, *20*(sup1), S4263–S4280. https://doi.org/10.1080/14606925.2017.1352924

Prihandono, D., Wijaya, A. P., Wiratama, B., Prananta, W., & Widia, S. (2024). Digital transformation to enhance Indonesian SME performance: Exploring the impact of market competition and digital strategy. *Problems and Perspectives in Management*, *22*(2), 103–113. https://doi.org/10.21511/ppm.22(2).2024.09

Quy, V. K., Thanh, B. T., Chehri, A., Linh, D. M., & Tuan, D. A. (2023). AI and Digital Transformation in Higher Education: Vision and Approach of a Specific University in Vietnam. *Sustainability (Switzerland)*, *15*(14). https://doi.org/10.3390/su151411093

Řeřicha, V., & Práger, L. (2021). The language of images in technologically modified environments. *American and British Studies Annual*, *14*, 108–117. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85121426071&partnerID=40&md5=ca22a6dc5c9fbf0867064db1480b6944

Rohman, F. A., Imam Khairi, A., & Devi, B. (2024). Improving Students Learning Activeness in Social Studies Subjects through Student Teams Achievement Division (STAD) Cooperative Learning Model. *Entita: Jurnal Pendidikan Ilmu Pengetahuan Sosial Dan Ilmu-Ilmu Sosial*, *6*(1), 137–148. https://doi.org/10.19105/ejpis.v6i1.13610

Sahni, S., Verma, S., & Kaurav, R. P. S. (2024). Understanding digital transformation challenges for online learning and teaching in higher education institutions: a review and research framework. In *Benchmarking*. Emerald Publishing. https://doi.org/10.1108/BIJ-04-2022-0245

Salmieri, L. (2019). The rhetoric of digitalization in Italian educational policies: Situating reception among digitally skilled teachers. *Italian Journal of Sociology of Education*, *11*(1), 162–183. https://doi.org/10.14658/pupj-ijse-2019-1-8

Saltos-Rivas, R., Novoa-Hernández, P., & Serrano Rodríguez, R. (2022). How Reliable and Valid are the Evaluations of Digital Competence in Higher Education: A Systematic Mapping Study. *SAGE Open*, *12*(1). https://doi.org/10.1177/21582440211068492

Saryazdi, R., Nuque, J., & Chambers, C. G. (2022). Pragmatic inferences in aging and human-robot communication. *Cognition*, *223*. https://doi.org/10.1016/j.cognition.2022.105017

Saurabh, K., Arora, R., Rani, N., Mishra, D., & Ramkumar, M. (2022). AI led ethical digital transformation: framework, research and managerial implications. *Journal of Information, Communication and Ethics in Society*, *20*(2), 229–256. https://doi.org/10.1108/JICES-02-2021-0020

Smith, S. P. (2024). “The trash is ruining the picture”: social media, sustainability, and the semiotics of pristine nature. *Social Semiotics*, 1–21.

Sun, Y., Liao, C.-C., Chang, S.-C., & Lin, R. (2022). The Communication Mechanism in the Workshop and Its Implications for the Sustainable Development of Traditional Crafts: A Case Study of Lacquer Culture in Taomi Eco-Village. *Sustainability (Switzerland)*, *14*(21). https://doi.org/10.3390/su142113813

Taylor, K. V. (2020). Building school community through cross-grade collaborations in art. *International Journal of Education Through Art*, *16*(3), 351–370. https://doi.org/10.1386/eta_00038_1

Tewksbury, D. (2015). Educating the precariat: Intern labour and a renewed approach to media literacy education. *TripleC*, *13*(2), 526–532. https://doi.org/10.31269/triplec.v13i2.594

Thomas, S. (2024). AI and Actors: Ethical Challenges, Cultural Narratives and Industry Pathways in Synthetic Media Performance. *Emerging Media*, *2*(3), 523–546. https://doi.org/10.1177/27523543241289108

Thompson, M. (2021). Narrative Mapping: Participant-Generated Visual Methodology for Health Communication Research and Pedagogy. *Health Communication*, *36*(5), 630–638. https://doi.org/10.1080/10410236.2020.1733228

Thorne, K. (2005). Designing virtual organizations? Themes and trends in political and organizational discourses. *Journal of Management Development*, *24*(7), 580–607. https://doi.org/10.1108/02621710510608731

van den Berg, L., & de Villiers, J. M. (2021). Tech talk: Development of a conceptual framework to enhance sport students’ communication skills and content learning through vlogs as an assessment tool. *Cogent Education*, *8*(1). https://doi.org/10.1080/2331186X.2021.1999785

Vanderburg, W. H. (2012). The Life and Work of Jacques Ellul. *Bulletin of Science, Technology & Society*, *32*(3), 183–186. https://doi.org/10.1177/0270467612459386

Vodă, A. I., Cautisanu, C., Grădinaru, C., Tănăsescu, C., & de Moraes, G. H. S. M. (2022). Exploring Digital Literacy Skills in Economics and Social Sciences and Humanities Students. *Sustainability (Switzerland)*, *14*(5). https://doi.org/10.3390/su14052483

Wagener, A. (2021). The Postdigital Emergence of Memes and GIFs: Meaning, Discourse, and Hypernarrative Creativity. *Postdigital Science and Education*, *3*(3), 831–850. https://doi.org/10.1007/s42438-020-00160-1

Wang, Q., & Keane, M. (2020). Struggling to be more visible: Female digital creative entrepreneurs in China. *Global Media and China*, *5*(4), 407–422. https://doi.org/10.1177/2059436420969624

Widiyanto Santoso, A., & Romadhon, S. (2021). Strategi Guru Ilmu Pengetahuan Sosial dalam Mengoptimalkan Aspek Afektif Peserta Didik di SMPN 8 Pamekasan. *ENTITA: Jurnal Pendidikan Ilmu Pengetahuan Sosial Dan Ilmu-Ilmu Sosial*, *3*(2), 237–256. https://doi.org/10.19105/ejpis.v3i2.4743

Xie, S. L., Siyi, L., & Han, R. (2022). Competing with artificial intelligence – can the records and information management profession withstand the challenge? *Records Management Journal*, *32*(2), 151–169. https://doi.org/10.1108/RMJ-08-2021-0033

Yang, X., Zhu, X., & Chen, D. (2023). Discourses regarding education governance in the digital age at K-12 level: Possibilities, risks, and strategies. *Teaching and Teacher Education*, *132*. https://doi.org/10.1016/j.tate.2023.104261

Zhang, G. (2025). *Visual Communication Design Based on Collaborative CAD and Visual Importance Under the Impact of New Media Art*.

Zhao, K., Peng, C., & Wu, Y. (2024). Exploring the Teaching Path of Visual Communication in the Digital Era. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, *19*(1), 1–17.

Zibin, A., Altakhaineh, A. R. M., Suleiman, D., & Al Abdallat, B. (2023). The Effect of Using an Arabic Assistive Application on Improving the Ability of Children with Autism Spectrum Disorder to Comprehend and Answer Content Questions. *Journal of Psycholinguistic Research*, *52*(6), 2743–2762. https://doi.org/10.1007/s10936-023-10019-8