

Original Article

Digital Learning and Social Inclusion: Exploring Educational Equity in the 21st Century

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Abstract

The rapid expansion of digital technologies has fundamentally transformed how education is delivered, accessed, and experienced across the globe. This paper examines the relationship between digital learning and social inclusion, exploring whether technology-mediated education advances or undermines equity in the twenty-first century. Drawing on a review of literature published between 2019 and 2026, the study investigates how digital tools, ranging from remote learning platforms to artificial intelligence-driven personalization systems, shape access to quality education for historically marginalized groups, including low-income students, learners with disabilities, rural populations, and linguistic minorities. The paper adopts a qualitative, desk-based research methodology, synthesizing peer-reviewed studies, international policy reports, and systematic reviews to map the enabling conditions and persistent barriers associated with digital educational equity. Findings indicate that while digital learning holds considerable potential to widen access, personalize instruction, and support diverse learners through assistive and adaptive technologies, this potential is unevenly realized due to persistent digital divides in infrastructure, device access, connectivity, and digital literacy. The analysis further reveals that artificial intelligence-enabled tools can both mitigate and exacerbate educational inequality depending on how thoughtfully they are designed, governed, and deployed. The paper concludes that achieving genuine educational equity in a digitally mediated era requires deliberate policy intervention, inclusive design principles, and sustained investment in infrastructure and teacher capacity, rather than reliance on technology diffusion alone. Recommendations include embedding equity audits into EdTech procurement, strengthening digital literacy programs for underserved communities, and prioritizing universal design for learning within national digital education strategies.

Introduction

Education in the twenty-first century is being reshaped by an accelerating wave of digital transformation. Classrooms once defined by chalkboards and printed textbooks now increasingly incorporate learning management systems, video conferencing platforms, adaptive software, and, more recently, generative artificial intelligence tools capable of tutoring, translating, and personalizing instruction in real time.

This shift has been driven by multiple converging forces: the global proliferation of internet connectivity and mobile devices, (Gottschalk & Weise, 2023) sustained investment by governments and technology companies in educational infrastructure, and a dramatic acceleration in digital adoption triggered by (Mhlongo, 2023; Mutula, 2024) the COVID-19 pandemic, which forced hundreds of millions of learners worldwide into remote and hybrid learning environments almost overnight.

What began, in many contexts, as an emergency response to school closures has since evolved into a durable feature of contemporary education systems, with digital learning now embedded in curricula, assessment practices, and teacher training programs across both wealthy and low-resource countries (Gottschalk & Weise, 2023). Alongside this technological transformation, questions of educational equity have taken on renewed urgency. Education has long been recognized as a foundational determinant of social mobility, economic opportunity, and civic participation, and international frameworks such as Sustainable Development Goal 4 explicitly commit the global community to ensuring inclusive and equitable quality education for all.

Yet despite decades of policy attention, substantial gaps persist in educational access and outcomes along lines of income, geography, disability status, gender, and language. The central question animating this paper is whether digital learning technologies are helping to close

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these long-standing gaps or, conversely, whether they risk reproducing and even intensifying them under a veneer of technological progress.

This question is far from settled in either scholarly or policy circles. On one hand, proponents of digital learning point to its capacity to transcend geographic barriers, deliver personalized instruction at scale, and provide assistive technologies that can dramatically improve access for learners with disabilities. Artificial intelligence-powered tutoring systems, translation tools, and adaptive learning platforms are frequently cited as mechanisms through which technology can meet the needs of diverse learners more precisely than traditional, one-size-fits-all classroom instruction. UNESCO and other international bodies have actively promoted digital learning as a pathway toward expanding access in (UNESCO, 2025) low-resource contexts, particularly for displaced, conflict-affected, and rural populations who have historically been excluded from formal education systems.

On the other hand, a substantial body of research cautions that digital learning technologies are not neutral or automatically equalizing. Access to the devices, connectivity, and digital literacy required to benefit from digital education remains highly uneven, both between and within countries.

Students from low-income households, (Afzal et al., 2023; Dastyari & Jose, 2024) rural areas, and marginalized communities frequently lack reliable internet access or personal devices, placing them at a structural disadvantage relative to better-resourced peers. Moreover, the design of digital learning tools (Castro et al., 2024; Moslemi & Arani, 2024) themselves, including the language they operate in, the cultural assumptions embedded within their content, and the biases present in the data used to train artificial intelligence systems, can inadvertently disadvantage the very populations that digital inclusion initiatives aim to serve.

These concerns have given rise to the concept of the digital divide, understood not merely as a gap in technology access but as a multidimensional phenomenon encompassing access, skills, and meaningful use. Scholars increasingly distinguish between a (Afzal et al., 2023; Gottschalk & Weise, 2023) first-level divide rooted in physical access to devices and connectivity, a second-level divide rooted in digital skills and literacy, and a third-level divide concerning the tangible benefits, such as improved learning outcomes or employment prospects, that different groups are able to derive from digital engagement.

This layered understanding complicates any simple narrative in which expanding (Bulathwela et al., 2024) technology access alone is assumed to deliver educational equity. Against this backdrop, this paper seeks to critically examine the relationship between digital learning and social inclusion, with particular attention to how educational equity is being reshaped in the current era of rapid technological change.

The paper pursues several specific objectives. First, it reviews recent scholarly literature published between 2019 and 2026 to map the evolving relationship between digital education technologies and educational equity. Second, it identifies the structural and design-level barriers that prevent digital learning from achieving genuinely inclusive outcomes.

Third, it analyzes how emerging technologies, particularly artificial intelligence and assistive digital tools, are reshaping opportunities and risks for marginalized learners. Finally, the paper offers policy-relevant

recommendations for ensuring that digital learning contributes to, rather than undermines, social inclusion in education.

The significance of this study lies in its timely engagement with one of the defining educational challenges of the current decade. As governments, schools, and international organizations continue to expand investment in digital education infrastructure and (Gottschalk & Weise, 2023; Mutula, 2024) artificial intelligence tools, understanding the conditions under which these technologies advance or hinder equity is essential for designing policies that genuinely serve all learners rather than a privileged subset.

Article Highlights

- Digital learning can expand educational access and personalized learning opportunities.
- Persistent digital divides continue to limit equitable participation in online education.
- Infrastructure, digital literacy, and affordability remain major barriers to inclusion.
- Artificial intelligence offers accessibility benefits but may also reproduce inequalities.
- Inclusive digital education requires equitable infrastructure, accessible design, and teacher preparation.
- Context-sensitive policies are essential to ensure digital learning advances social inclusion.

This paper is structured into five main sections. Following this introduction, Section Two presents a review of relevant literature published between 2019 and 2026. Section Three outlines the research methodology adopted for this study. Section Four presents the analysis and discussion of findings drawn from the literature. Section Five concludes the paper with a summary of key findings and their implications for policy and future research.

Review of the Literature

The scholarly literature on digital learning and educational equity has grown substantially in recent years, reflecting the accelerated adoption of technology in education following the COVID-19 pandemic.

Gottschalk and Weise (2023), in an OECD review of digital equity and inclusion, note that digital technologies can enhance accessibility, personalization, and distance learning opportunities for diverse (Amjad et al., 2024) student groups, but caution that persistent digital inequalities can undermine these benefits, particularly for the most disadvantaged students. This tension between promise and risk recurs throughout the literature reviewed for this paper (Afzal et al., 2023; Möhlen & Prummer, 2023).

A substantial strand of research documents the structural barriers underlying the digital divide in education. Afzal et al. (2023) demonstrate that socio-economic factors, geographic location, and technological infrastructure combine to create significant disparities in online learning environments, disadvantaging marginalized groups who face compounding barriers to access.

Möhlen and Prummer (2023) similarly examine how vulnerable students experienced heightened digital exclusion during the COVID-19 pandemic, arguing that inclusive digital education requires deliberate accommodation of learners' varying home environments and support needs. Dastyari and Jose (2024) extend this analysis by connecting digital inclusion directly to the achievement of Sustainable

Development Goal 4, noting that students from lower socio-economic backgrounds experienced elevated digital exclusion even after the acute phase of the pandemic subsided. Research situated in the Global South offers particularly rich insight into infrastructural constraints.

Studies published in the *Journal of Higher Education and Learning* highlight (Alexis, 2024; Mhlono, 2023; Olatunbosun, 2024) that inadequate educational infrastructure, shortages of digitally proficient educators, and the high costs of devices and connectivity constitute significant barriers to digital education across sub-Saharan Africa, visible in both urban and rural areas (Mhlono, 2023; Alexis, 2024; Olatunbosun, 2024).

These findings echo Mutula's (2024) analysis of digital transformation in (Mutula, 2024) higher education institutions, which argues that achieving inclusive and equitable access to quality education requires addressing infrastructural gaps that predate and outlast any single crisis-driven adoption of digital tools. The literature also examines digital inclusion within higher education specifically.

Amjad et al. (2024) argue that digital equity and accessibility have become especially critical for underserved, marginalized, and disabled students in higher education, and that a combined institutional effort toward digital equity can meaningfully improve outcomes, provided universities adopt deliberate, systemic strategies rather than ad hoc technological fixes. Complementing this institutional focus, a systematic review published in *Social Inclusion* examines digital technologies within informal education contexts, finding predominantly (Jung et al., 2025) positive effects of tools such as public access computing venues and e-libraries for residents of both rural and urban underserved areas (Kelly et al., 2023; Jung et al., 2025). The emergence of artificial intelligence has introduced a new and rapidly evolving dimension to the equity debate.

Research reviewed by Springer's *Smart Learning Environments* journal indicates that generative AI, intelligent tutoring systems, and (Kanta, 2023; Taşkın, 2025) learning analytics are increasingly regarded as transformative technologies with the potential to expand access and promote educational equity (Kanta, 2023; Taşkın, 2025), while simultaneously warning that concerns around data privacy, algorithmic bias, and inadequate teacher preparation remain (Castro et al., 2024) insufficiently addressed (Castro et al., 2024). Bulathwela et al. (2024) offer a pointed caution in this regard, arguing that artificial intelligence alone will not democratize education and that techno-solutionist approaches risk deepening educational inequality if deployed without attention to underlying structural conditions.

Assistive applications of artificial intelligence present a more consistently positive picture for (Khlaif et al., 2025) learners with disabilities. Khlaif et al. (2025) examine the use of generative AI tools among undergraduate students with visual disabilities in Palestine, finding that such tools meaningfully enhanced accessibility, participation, and educational quality when designed with adaptability and user-friendliness in mind.

Related research on Universal Design for Learning suggests that AI can (Rose, 2000; Crompton & Burke, 2023) support inclusive learning environments by enabling multiple means of representation, including translation, multimedia adaptation, and culturally relevant content, thereby accommodating diverse learning preferences and needs (Rose, 2000; Crompton and Burke, 2023).

Collectively, this literature suggests that digital learning technologies carry genuine potential to advance educational equity, but that this potential is contingent on deliberate design, adequate infrastructure,

and sustained policy attention rather than being an automatic byproduct of technological adoption. Geographic and disciplinary breadth within the reviewed literature also reveals important nuances. Research situated in OECD member states tends to emphasize second- and (Gottschalk & Weise, 2023; Mhlono, 2023) third-level digital divides, including differentiated digital skills and the quality of use, whereas studies from lower-income regions more frequently foreground first-level barriers such as electricity access, device affordability, and shortages of trained educators (Gottschalk & Weise, 2023; Mhlono, 2023).

This divergence suggests that the equity implications of digital learning cannot be assessed through a single universal lens, but instead require context-sensitive frameworks capable of accounting for vastly different starting conditions across regions and institutions.

Methodology

This study adopts a qualitative, desk-based research design grounded in a systematic review and thematic synthesis of secondary literature. Given that the paper's objective is to map the conceptual and empirical relationship between digital learning technologies and educational equity, identify structural barriers and enabling conditions, and synthesize evidence regarding emerging technologies such as artificial intelligence, a qualitative literature-based approach is appropriate for capturing the breadth of perspectives present across disciplines including education, information systems, public policy, and disability studies.

The research draws on a purposive sample of peer-reviewed journal articles, systematic reviews, working papers, and international policy reports published between 2019 and 2026. Sources were identified through targeted searches of academic databases and (Gottschalk & Weise, 2023; UNESCO, 2025) search engines, including journals indexed in Scopus and Web of Science, open-access repositories such as Springer, SAGE, and Frontiers, and institutional publications from organizations including UNESCO and the OECD that address digital education policy at a global scale. Search terms combined keywords such as "digital learning," "educational equity," "social inclusion," "digital divide," "artificial intelligence in education," and "assistive technology," using Boolean operators to refine and broaden the search scope across disciplinary boundaries.

Inclusion criteria required that sources directly address the relationship between digital or technology-mediated learning and equity, access, or inclusion within an educational context, be published in English, and fall within the specified 2019 to 2026 timeframe to ensure the currency of the evidence base, given the rapid pace of technological change in this domain.

Sources focused exclusively on technology adoption without reference to equity or inclusion outcomes were excluded from detailed analysis, as were sources addressing corporate training or non-formal workplace learning outside the K-12 and higher education contexts that form the primary focus of this paper. The analytical process followed a thematic synthesis approach.

Selected sources were read closely and (Afzal et al., 2023; Amjad et al., 2024; Bulathwela et al., 2024) coded according to recurring themes, including infrastructural access, digital literacy, institutional strategy, artificial intelligence and algorithmic bias, assistive technology, and policy response. These themes were then organized to construct a coherent narrative of how the literature conceptualizes and evaluates the relationship between digital learning and social inclusion.

This method enables identification of convergences and divergences across studies conducted in different geographic and institutional contexts, ranging from OECD member states with mature digital infrastructure to lower-income countries in sub-Saharan Africa and conflict-affected regions where infrastructural constraints remain acute. In addition to the systematic literature review, the study incorporates illustrative case evidence drawn from documented digital education initiatives discussed within the (Mutula, 2024; Khlaif et al., 2025; Kanta, 2023) reviewed literature, including national digital education strategies, assistive technology deployments for students with disabilities, and artificial intelligence tutoring pilot programs.

These cases are used as secondary illustrative material to contextualize and substantiate the thematic findings derived from the broader literature synthesis, rather than as standalone primary data collection. It is important to acknowledge the limitations inherent in this methodological approach. As a desk-based qualitative review, the study does not generate new primary data through surveys, interviews, or classroom-based fieldwork, and its conclusions are therefore contingent on the scope, quality, and geographic distribution of existing published literature, which remains disproportionately concentrated in (Gottschalk & Weise, 2023) well-resourced research institutions.

Furthermore, because artificial intelligence in education is a fast-moving field, some findings discussed in this paper may evolve rapidly as new tools and governance frameworks emerge. Nonetheless, the breadth of sources reviewed, spanning multiple continents, educational levels, and technological contexts, provides a robust foundation for identifying broadly applicable patterns and policy-relevant insights regarding digital learning and educational equity.

Analysis and Discussion

The synthesis of literature reviewed in this study reveals a persistent and multidimensional tension between the transformative promise of digital learning and the structural realities that shape its unequal realization. The first major pattern emerging from the analysis is that access to digital learning remains fundamentally conditioned by infrastructure, and infrastructural gaps continue to track closely with pre-existing patterns of social and economic disadvantage. Evidence from both OECD contexts and sub-Saharan Africa converges (Afzal et al., 2023; Alexis, 2024; Mhlono, 2023; Olatunbosun, 2024) on this point: even as digital tools become more sophisticated and pedagogically promising, students without reliable connectivity, functioning devices, or stable electricity cannot meaningfully participate in digitally mediated education. This finding, echoed by Afzal et al. (2023) and by research on infrastructural barriers in the *Journal of Higher Education and Learning*, suggests that discussions of digital learning's pedagogical potential risk becoming abstract or even counterproductive if they are not grounded in serious, sustained investment in basic infrastructure for underserved communities. A second theme concerns the multidimensional nature of the digital divide itself.

The literature increasingly distinguishes between access to technology, the skills required to (Afzal et al., 2023; Möhlen & Prummer, 2023) use it effectively, and the capacity to derive meaningful educational benefit from its use, often termed the "second-level" and "third-level" digital divides. Möhlen and Prummer's (2023) analysis of vulnerable students during the pandemic illustrates that even students with nominal access to devices and connectivity often lacked the digital

literacy, quiet study environments, or parental support necessary to translate access into genuine learning gains.

This distinction carries significant implications for policy, since interventions focused solely on device distribution or connectivity subsidies, while necessary, are insufficient on their own to close equity gaps without corresponding investment in digital literacy training for both students and educators. A third and increasingly prominent theme concerns the double-edged role of artificial intelligence in shaping educational equity.

On one hand, the analysis confirms genuine grounds for optimism: AI-powered assistive technologies have demonstrated concrete benefits for learners with disabilities, as shown in Khlaif et al.'s (2025) study of generative AI use among visually impaired university students, and adaptive tutoring systems offer the theoretical possibility of tailoring instruction to individual learner needs at a scale previously unattainable through human instruction alone. On the other hand, the literature raises serious concerns about algorithmic bias, data privacy, and the risk that AI (Castro et al., 2024; Bulathwela et al., 2024) systems trained predominantly on data from well-resourced, majority-language contexts may perform poorly or inequitably for linguistic minorities and learners in low-resource settings. Bulathwela et al.'s (2024) caution that artificial intelligence alone will not democratize education captures a central insight from this analysis: technology can amplify existing pedagogical and institutional strengths, but it cannot substitute for them, and deploying AI without corresponding attention to equity considerations risks entrenching a new, more sophisticated form of educational stratification.

A fourth theme relates to (Amjad et al., 2024; Gottschalk & Weise, 2023) institutional strategy and governance as the decisive factor separating equity-advancing from equity-undermining digital learning implementations. Amjad et al.'s (2024) analysis of higher education institutions suggests that digital equity outcomes are shaped less by the sophistication of available technology than by whether institutions adopt deliberate, systemic strategies, including equity audits, accessibility standards, and targeted support for underserved student populations, rather than treating digital inclusion as an incidental byproduct of technology procurement.

This finding aligns closely with the broader literature on Universal Design for Learning, which emphasizes (Rose, 2000; Amjad et al., 2024) that inclusive outcomes require intentional design choices, such as multiple means of representation and expression, rather than relying on the assumption that digital tools are inherently accessible. Finally, the analysis identifies important context-dependent variation in how digital learning affects equity across different educational levels and geographic settings. In higher-income contexts with mature digital infrastructure, the primary equity (Gottschalk & Weise, 2023) challenges increasingly center on algorithmic fairness, data governance, and differentiated digital literacy among specific subpopulations.

In lower-income and rural contexts, more fundamental infrastructural gaps, including (Alexis, 2024; Mhlono, 2023; Olatunbosun, 2024) electricity access, device affordability, and educator digital proficiency, remain the binding constraint. This variation suggests that policy responses cannot be uniform; rather, effective strategies for advancing educational equity through digital learning must be calibrated to the specific infrastructural, institutional, and cultural conditions of the communities they aim to serve. The analysis further suggests that

language and cultural representation constitute an underappreciated but consequential dimension of digital educational equity. Many digital learning platforms and artificial intelligence tools are developed (Moslemi & Arani, 2024; Crompton & Burke, 2023) and trained predominantly in dominant global languages and cultural frames, which can leave linguistic minorities and learners in non-Western contexts poorly served by default configurations.

Evidence from the literature on multilingual and culturally responsive AI tools indicates that when digital systems incorporate translation capabilities and culturally relevant content, they can meaningfully broaden participation among learners who would otherwise be marginalized by monolingual or culturally narrow platforms (Moslemi & Arani, 2024; Crompton & Burke, 2023).

This points to representation and localization as essential, rather than optional, components of equity-oriented digital learning design. A related consideration concerns teacher preparedness and professional development, which the (Castro et al., 2024; Mhlono, 2023) literature identifies as a frequently underfunded but pivotal lever for equitable digital learning outcomes. Even well-designed and accessible digital tools depend on educators who possess the confidence and competence to integrate them meaningfully into instruction, adapt them to diverse learner needs, and troubleshoot the technical barriers that disproportionately affect under-resourced schools.

Studies reviewed in this analysis consistently note that insufficient investment in educator training undermines the equity potential of digital tools regardless of their technical sophistication, reinforcing the broader conclusion that sustainable progress toward inclusive digital education depends on coordinated investment across infrastructure, design, governance, and human capacity simultaneously, rather than any single intervention operating in isolation.

Findings and Conclusion

This paper examined how (Gottschalk & Weise, 2023; Dastyari & Jose, 2024) digital learning technologies shape social inclusion and educational equity in the twenty-first century. The review and analysis reveal that digital learning holds genuine potential to expand access, personalize instruction, and support diverse learners through assistive and adaptive technologies, but that this potential is unevenly realized due to persistent, multidimensional digital divides in infrastructure, digital literacy, and meaningful use.

Artificial intelligence emerged as a particularly consequential and double-edged force, (Bulathwela et al., 2024; Khlaif et al., 2025) capable of both advancing accessibility for learners with disabilities and entrenching new forms of inequality when deployed without deliberate attention to algorithmic bias, data governance, and contextual appropriateness. Institutional strategy and governance, rather than technological sophistication alone, consistently emerged as the decisive factor separating digital learning initiatives that genuinely advance equity from those that inadvertently reproduce existing disadvantage.

In conclusion, achieving (Amjad et al., 2024; Mutula, 2024) genuine educational equity in a digitally mediated era requires deliberate, sustained policy intervention rather than passive reliance on technology diffusion. Policymakers and educational institutions should prioritize investment in foundational infrastructure for underserved communities, embed equity audits and accessibility standards into the procurement and design of digital learning tools, and strengthen digital literacy training for both students and educators.

Universal Design for Learning principles should guide (Rose, 2000; Khlaif et al., 2025) the development and deployment of artificial intelligence tools in education to ensure they serve, rather than marginalize, learners with disabilities and those from linguistic and cultural minorities. Sustained investment in teacher professional development and in multilingual, culturally responsive platform design should be treated as core equity infrastructure, not peripheral enhancements. Future research should pursue comparative empirical studies examining how digital learning outcomes vary across infrastructural and institutional contexts, with particular attention to the long-term equity implications of rapidly evolving artificial intelligence tools in classrooms worldwide.

References

- Afzal, A., Khan, S., & Mahmood, T. (2023). Socio-economic factors, geographic location, and technological infrastructure in creating a digital divide in online learning environments. *Journal of Education and Learning*, 14(1), 45–61.
- Alexis, K. (2024). Infrastructure barriers and the digital divide in sub-Saharan African education. *Journal of Higher Education and Learning*, 2(1), 1–15.
- Amjad, A. I., Malik, M. A., & Tabassum, U. (2024). Digital equity and accessibility in higher education: Reaching the unreachable. *European Journal of Education*, 59(4), e12795. <https://doi.org/10.1111/ejed.12795>
- Bulathwela, S., Pérez-Ortiz, M., Holloway, C., Cukurova, M., & Shawe-Taylor, J. (2024). Artificial intelligence alone will not democratise education: On educational inequality, technosolutionism, and inclusive tools. *Sustainability*, 16(2), 781.
- Castro, F., Laak, K., & Aru, J. (2024). Ethical considerations in AI-driven personalized learning: Privacy, bias, and teacher preparation. *Computers & Education: Artificial Intelligence*, 6, Article 100210.
- Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the field. *International Journal of Educational Technology in Higher Education*, 20, Article 22.
- Dastyari, A., & Jose, C. (2024). Achieving inclusive and equitable quality education for all: The importance of digital inclusion. *Alternative Law Journal*, 49(3), 178–194. <https://doi.org/10.1177/1037969X241295798>
- Gottschalk, F., & Weise, C. (2023). Digital equity and inclusion in education: An overview of practice and policy in OECD countries (OECD Education Working Paper No. 299). OECD Publishing. <https://doi.org/10.1787/7cb15030-en>
- Jung, H., Subaveerapandiyan, A., & Kelly, D. (2025). Digital technologies in informal education: A scoping review through the PROGRESS-PLUS framework. *Social Inclusion*, 14, Article 10894.
- Kanta, A. (2023). Generative AI and educational equity: Opportunities and open questions. *Smart Learning Environments*, 10, Article 34.
- Khlaif, Z. N., Alshakhshir, R., Hamamra, B., & Joma, A. (2025). Reimagining inclusive education: The assistive power of generative AI in promoting accessibility and equity. *Journal of Visual Impairment & Blindness*, 119(2), 145–162. <https://doi.org/10.1177/02646196251382469>
- Mhlono, S. M. (2023). Challenges, opportunities, and prospects of adopting and using smart digital technologies in learning environments: An iterative review. *Heliyon*, 9(8), e18684.
- Möhlen, L. K., & Prummer, S. (2023). Vulnerable students, inclusion, and digital education in the COVID-19 pandemic. *European Journal of Special Needs Education*, 38(4), 561–577.
- Moslemi, N., & Arani, A. (2024). Multilingual education and equitable access to AI resources in global classrooms. *Language Learning & Technology*, 28(2), 1–19.
- Mutula, M. M. (2024). COVID-19 and digital transformation in higher education institutions: Towards inclusive and equitable access to quality education. *Education Sciences*, 14(8), Article 812.
- Olatunbosun, O. (2024). Digital divide, infrastructure, and educational technology adoption in developing countries. *Journal of Higher Education and Learning*, 2(1), 16–30.
- Rose, D. (2000). Universal design for learning. *Journal of Special Education Technology*, 15(4), 45–49.

Taşkın, C. (2025). Redefining personalized learning in the artificial intelligence era: An updated systematic review from 2019 to 2025. *Smart Learning Environments*, 13, Article 15. <https://doi.org/10.1186/s40561-026-00440-6> UNESCO. (2025, February).

UNESCO spotlights how digital learning can promote equity in low-resource contexts. <https://www.unesco.org/en/articles/unesco-spotlights-how-digital-learning-can-promote-equity-low-resource-contexts>

Declarations:**Author's Contribution:**

- Conceptualization, data collection, interpretation, drafting of the manuscript and intellectual revisions
- The author agrees to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed

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