EQUITY AND ACCESSIBILITY IN DIGITAL PEDAGOGY: ADDRESSING THE DIGITAL DIVIDE IN PRIMARY AND SECONDARY SCHOOLS

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Abstract

The use of digital technology in education is accelerating rapidly. Although this is transforming teaching and learning, it is also exacerbating inequities and access issues for students in primary and secondary schools. The digital divide is the difference in access to Devices, the internet, and digital literacy. It makes the experience of digital pedagogy unequal. The study aims to find out how digital inequalities influence learners' experiences and outcomes and what can be done by schools, teachers, and policymakers to bridge them. To prepare for the 2030s and mitigate excessive dependence on technology-mediated learning during and after the COVID-19 pandemic, qualitative research was designed using secondary data. This was done in peer-reviewed journals, government reports, and international case studies (2020-2025). It has been found that inequalities are most pronounced in low-income and rural communities where the lack of infrastructure, limited teacher training, and inadequate support systems limit meaningful engagement with online tools and apps. Alternatively, schools with greater resources are more amenable to adopting inclusive digital practices when location is taken into consideration. The study found that it is more than just providing technology that can promote equity in digital pedagogy. There is also a need for digital literacy, professional development, and policy support. This research helps to aggregate understanding of the multifaceted digital divide while suggesting evidence-based suggestions for enhancing accessibility, inclusivity, and equity during digital education as a provision of the New Education Policy 2020. Closing these gaps will help education systems reach more sustainable and equitable learning spaces for students.
Keywords: Accessibility, Digital divide, Digital pedagogy, Equity, Inclusivity

1. Introduction

Introducing digital pedagogy in primary and secondary education has become a typical trend of the 21st century. States in the developed world have almost 90% of schools currently using some kind of digital learning, and the actual access to sound digital infrastructure is being found in nearly 45% of the schools in low-income states. The COVID-19 pandemic has accelerated these developments because it forced an abrupt need to switch to online platforms, as over 1.6 billion learners worldwide had to move to their distance learning school due to school closures. This fast conversion demonstrated the opportunities of the online learning perception as well as issues inherent to it (Cabasan, 2024). Technological improvements brought improved flexibility, innovativeness, and interest, on the one hand, and increased the digital divide between those students who have access to devices and good internet access and those without such access, which increased disparities in the IFRS to quality instruction, on the other hand.

Since the pandemic, it can be observed that schools have started to implement hybrid and blended systems. However, there are still inequalities caused by insufficient connectivity in rural and less privileged regions and the digital illiteracy of teachers. The majority of educators lack sufficient training to incorporate technology in pedagogy, thus results in less

than ideal learning effects. Such inequalities highlight the importance of reconsidering the idea of digital pedagogy as something capable of providing fair access to resources, abilities, and assistance (Lembani et al., 2020). Filling in such gaps is important in the attainment of sustainable machinery-based education with respect to the ambitions of equity and excellence in the New Education Policy 2020.

Digital divide is defined as a disparity in accessing technology, online digital literacy, as well as the ability to be involved in the learning process in the online community. This disparity is reflected in several factors in the educational industry: schools in urban regions are usually better equipped in terms of their connectivity and their access to computers, tablets, and high-speed internet, whereas rural communities do not have many resources available to them (Vitalis et al., 2025). In rural areas, the poor internet connection and a lack of devices limit the access of children to the internet. These differences are aggravated by the socio-economic factor, as children in the generation with low income often do not have the structure and parental support to be able to interact with digital learning (Mathrani, Sarvesh, & Umer, 2022). The parts of gender also plays a role in participation, within which girls in certain parts are less likely to have access to technological devices, or they are not likely to participate more in technology-based learning.

Such inequalities directly influence the outcomes of learning since students with lower digital capabilities find it hard to complete their assignments and usage of interactive content as well as to acquire the necessary skills of the 21st century. The digital divide in primary and Secondary schools alters the existing inequalities in education, and it further generates unequal chances in academic performance, self-development, and further adaptability in the technoscience-led world (Moyo et al., 2022).

The main lessons related to the achievement of equity and accessibility of digital pedagogy lead to an understanding that the digital divide includes not only inequities in accessing the technology but also a lack of connection to quality devices, stable Internet connectivity, as well as necessary skills and abilities in digital literacy. Digital equity and inclusion have to be core at all levels of education, starting with early childhood stages through to primary and secondary education, to the higher education levels (Davoodi, 2024). They are also needed, especially in adult learning and lifelong learning, since society is becoming very digitalized. Although it cannot be complete to mention that diversity and inclusion must be considered at every educational level, the elements that evoke this debate in the context of compulsory education include evidence and policies that are the most relevant in the context of primary and secondary education. It outlines how various online tools, which include computers, tablets, mobile phones, and other technologies that are more advanced and innovative to date, can be utilized to improve and maintain learning outcomes for all students.

In the future, it can be seen that technological advancements can promise a significant enhancement in educational and well-being environments. In their conception and application in the educational environment based on diversity, equity, and inclusion as the principles, digital technologies can be successfully used to work with students of different kinds and enable the maximum potential of each student to be identified and achieved (Guerrero-Quiñonez et al., 2023). Finally, the study can give evidence-based information to the schools, educators, and policymakers to take measures, which will ensure that all students, irrespective of their socio-economic status, geographic position, or gender, are beneficiaries of digital education equally.

However, this study is aimed to investigate why equitable access to digital learning is essential for primary and secondary education; to explore how the digital divide impacts students' learning outcomes and participation; to select the main barriers and challenges that prevent equitable access to digital pedagogy; to study strategies along with interventions that can bridge the digital divide and promote accessibility.

2. Theoretical Framework

Key Concepts and Definitions

Table 1. Definition of key terms

Concept	Definition
Digital Pedagogy	Digital pedagogy refers to teaching and learning practices that integrate digital technologies to enhance knowledge acquisition, engagement, and collaboration. It includes the use of digital tools, online platforms, and multimedia resources to design, deliver, and assess instruction effectively in both primary and secondary education contexts (Väätäjä & Ruokamo, 2021).
Equity	Equity in education ensures that all students receive fair treatment, opportunities, and resources tailored to their individual needs. It addresses systemic inequalities, providing support for marginalized or disadvantaged groups, so that every learner can achieve their full potential regardless of socioeconomic background, ability, or location (Apelehin *et al.,*2025).
Accessibility	Accessibility refers to designing digital learning environments, content, and tools that can be used by all students, including those with disabilities or learning differences (Beyene *et al.,*2023). It involves removing barriers, providing assistive technologies, and following universal design principles to ensure equal participation and engagement in educational activities.
Inclusivity	Inclusivity in education fosters a learning environment where diversity is valued, and every student feels respected, supported, and able to participate fully (Parveen, 2024). It emphasizes representation, culturally responsive teaching, and practices that promote belonging, removing discrimination or bias in digital and face-to-face learning contexts.
Digital Divide	The digital divide refers to the gap between individuals or communities with adequate access to digital technologies and those without (Afzal *et al.,*2023). It encompasses disparities in device availability, internet connectivity, digital literacy, and technological skills, which can lead to inequitable educational opportunities and hinder learning outcomes in primary and secondary schools.

Relevant Theories

a. Socio-Cultural Learning Theory (Vygotsky)

Socio-cultural learning theory, developed by Lev Vygotsky, acknowledges learning as a social process. This process is further shaped through the effective interaction with the peers, educators, along the community in a broader spectrum. Collaboration, dialogue, and shared experiences have been helpful in terms of co-constructing knowledge rather than relying solely on individual effort (Daramola *et al.,*2024). The role of online forums, along with different collaborative tools as well as virtual classrooms, is underscored by this perspective within the sphere of digital pedagogy. Combinedly, these attributes may bring meaningful experiences of learning within the classroom.

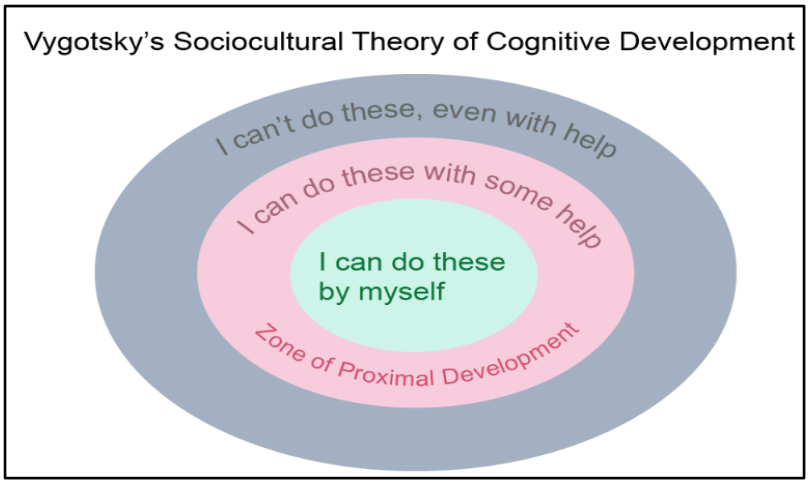

Figure 1 Socio-Cultural Learning Theory
(Source: Grageda *et al.,*2022)

The scaffolding is considered to be the central element of this theory, where temporary support has been given by the teachers along with more knowledgeable peers. This is responsible for guiding the learners in terms of providing support towards higher understanding levels (Grageda et al., 2022). Guided participation enables the students to do what they would not have been in a position to do on their own, progressively acquiring skills and knowledge. In the context of a blended or online learning process, this scaffolding may make transitions in structured discussion boards or make interactive tutorials by using platforms that are digitally driven.

The equity, as well as the digital divide in primary and secondary education, is addressed through Socio-cultural theory. In this matter, only providing access to the internet or devices is not sufficient. Adequate support is to be provided along with opportunities for collaboration to the learners so that a comprehensive overview can be obtained (Massa, 2024). Inequalities within the support from the teachers or a lack of literacy in the digital world may be responsible for exacerbating the existing gaps. As a result, some students may miss the opportunity in terms of getting full benefits from the resources of digital learning.

b. Digital Capital Theory

The ability of the student in terms of benefiting from digital technologies is emphasised by the "Digital Capital Theory." In this matter, it has been stated that getting access to devices is not enough for students, rather that they must accumulate skills along with competencies and knowledge. This theory defines digital interaction as a capital, with more digitally literate, technologically familiar, problem-solving learners being well-positioned to succeed in online learning activities (Pitzalis & Porcu, 2024). Both the technical as well as cognitive and social skills are addressed through the "Digital Capital Theory" in the context of primary and secondary education.

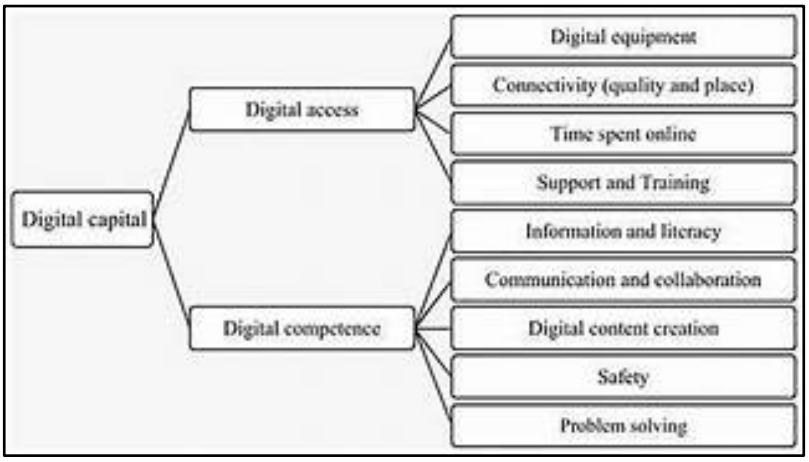

Figure 2. Digital Capital Theory
(Source: Rizk & Hillier, 2022)

The inequalities in terms of attaining digital resources have also been highlighted through this theory. In addition to this, it also highlights how there are differences between training and literacy across socio-economic groups. For instance, if students are coming from an under-resourced school, then they may have access to computers but lack proper guidance in terms of using them effectively. This, as a result, is responsible for reducing the educational value of those tools (Rizk & Hillier, 2022). On the contrary, if students are coming from a privileged schooling, then they have all the exposure to technology along with adequate guidance, which provides them a competitive advantage. "Digital Capital Theory" also offers a construct to evaluate impediments to successful digital pedagogy. These gaps would help teachers and policymakers to develop interventions that would accumulate digital capital among all learners.

Integration of Theories

Complementary perspectives have been provided by both "Socio-Cultural Learning Theory" and "Digital Capital Theory" in terms of understanding and assessing the equity as well as accessibility within the digital pedagogy. The "socio-cultural theory" proposed by Vygotsky focuses on learning as a socially mediated process in which interaction, collaboration, and scaffolding are critical factors in student development (Al-Amrani, 2022). It implies that fair online learning should not only be seen as access to new technologies but should also create a conducive space that promotes facilitated engagement and collaboration with peers. This is responsible for ensuring the fact that necessary social as well as instructional support is given to the students so that they can thrive within the digital sphere. On the other hand, the integration of "the digital capital theory" is responsible for dealing with the competencies as well as the resources (Chen *et al.,*2024). This is responsible for providing an opportunity to the learners in terms of utlising the overall technology effectively. Equity in digital pedagogy, as shown when the theories are combined, is based on the distribution of digital resources and skills as well as the social context of learning. To resolve the digital divide, two strategies are necessary: building the digital capital of students by training and provisioning them.

Review of Previous Studies

There are existing studies conducted on digital pedagogy along with the digital divide, which is responsible for highlighting different inequalities. In this matter, the learning outcomes are different across the context of different socio-economic and geographic contexts. As suggested by Van De Werfhorst et al. (2022), there is a rise in global investment in educational technology, but inequalities continue to be apparent in the availability of devices, access to the

internet, and digital literacy, especially in low-income and rural schools. In addition to this, the extension of the digital divide has reached beyond physical access so that the overall differences can be encompassed (Vassilakopoulou & Hustad, 2023). This may provide a comprehensive overview of the process through which students utlise technology within their learning process, along with the influence of the teacher.

Equitable access towards technological advancement is not responsible for transitioning to an equitable experience of learning automatically. In this matter, students who have stronger competence, along with the support of the teacher in terms of experience, have higher engagement as well as achievement within the learning environment (Ong & Quek, 2023). On the contrary, if students lack digital skills, they are more likely to experience exclusion. Apart from this, there is a strong influence of socio-cultural factors on digital engagement. Schools that had collaborative teaching patterns as well as scaffolded instruction in digital platforms were likely to reduce learning disparities between advantaged and underprivileged students. This is in line with the socio-cultural theory of Vygotsky, which is responsible for focusing on making interactions socially, along with achieving guidance.

Gaps in Literature

Available literature does not comprise unified structures that connect socio-cultural learning and digital capital theories to tackle the questions of equity and access in digital learning.

3. Method

This study follows an exploratory qualitative design in which the researcher will examine the role of equity and accessibility, which encompasses the digital learning process, in the primary and secondary education context. Since the digital divide is a wide and dynamic problem, this strategy allows considering diverse thoughts and policies without being bound to strict aims and measurable boundaries (Makri & Neely, 2021). The study makes use of secondary data, which implies it is based on the already existing data in the form of scholarly articles, reports, and case studies. There will be no new interviews and surveys. The study will, however, conduct a systematic review of the available literature generated by other researchers and institutions.

To conduct the study, the researcher will use data obtained with respect to reputable and recent publications that will be published within the range of 2020-2025. These literature sources will include scholarly journal articles, government reports, as well as international case studies that revolve around digital learning, equity, and access. The chosen period will provide information on transformations to online and blended education after the COVID-19 pandemic.

Authoritative sources such as the documents of the UNESCO, OECD, and the World Bank will be used as the main references, in addition to such academic databases as Google Scholar and ProQuest. These databases offer valid information on the initiatives undertaken by different areas and nations in terms of closing the digital gap in schools (Kurtaliqi et al., 2024). It is the combination of the global and the local case studies that will enable cross-country comparisons to be made in the research. Such a comparative approach will determine items increasing the equity of digital education and help the schools to enhance the accessibility of technology and education resources to the learners on the primary and secondary levels.

The sources of data will be academic search sites, such as Google Scholar and ProQuest, that will provide the relevant documents and publications. Some of the keywords that are included in the search strategy are: digital pedagogy, digital divide, equity in education, accessibility, primary schools, and secondary schools. The search is narrowed down by finding materials most relevant to the topic by using Boolean operators. Inclusion criteria focus on the need to cover the ideas of equity, access, or the digital divide in the primary and secondary education, as well as studies that are published between 2020 and 2025 are in English, guarantee

the application of topics and content of the research. Exclusion criteria exclude those dedicated to higher education or who lack access to education in the digital world (Jain, 2021). After recognition, the corresponding literature and reports are classified into thematic areas, like access to technology, teacher readiness, policy, and student engagement, so that the dataset is credible, focused, and meets the research outcomes.

The thematic analysis was used in this research to identify the key concepts that occur in the gathered materials. At first, reading the identified all the chosen documents will be conducted with precision to learn familiar terms, ideas, or concerns in terms of equity and accessibility in online learning. These factors will be coded and clustered into themes that will reveal the key issues and remedies relating to the digital divide.

After categorization of the information, patterns and interrelations between the themes will be analyzed by the researcher in order to know the relationships between them. This process assists in elaborating on the variables that make digital learning fair or unfair to students in primary and secondary educational institutions (Turin et al., 2022). The reliability and the clarity of the study will be ensured by ensuring that every step of the procedure will be recorded in writing, and all the sources will be rigorously verified. The validity and equilibrium of the analysis will be enhanced by comparing the results between the various reports and studies.

4. Findings And Discussion

Theme 1: The Importance of Equitable Access to Digital Learning

Digital learning is now an important aspect of the educational process in primary and secondary education. The use of computers, tablets, and the Internet contributes to the process of acquiring new knowledge by students in more interactive ways. It allows students to watch instructional videos, attend online courses, do homework in the form of quizzes, and interact with their colleagues in the absence of being in the same room together (Tate & Warschauer, 2022). Still, not all students have equal opportunities to use these digital tools. Whereas to some children, homes contain computers and high-speed internet connections, to others, it is not the case. This gap has been referred to as the digital divide and has made access to learning unequal in that students who do not have access to technology are not able to access online materials as other students do due to such disparity (Amjad et al., 2024). Fair access to digital learning demands that all students have the materials, expertise, and provisions to use technology in learning.

Figure 3. Importance of Equitable Access to Digital Learning
(Source: Selvaraj et al., 2021)

The accessibility of digital learning by schools to everyone will help the students enjoy the benefits of lessons and activities. As an example, a child with a tablet and an Internet connection at home will manage to complete tasks on time and freedom of learning additional learning resources, whereas the reverse could be true of a child without such resources. The issue of access does not emphasize only its hardware and connection: the students also need the support of teachers and their families to utilize technology (Selvaraj et al., 2021). Even good learners will not be able to achieve the optimal results of digital tools without this support.

Students living in rural areas or even low-income families have been shown to face the most challenges. Most of the schools in these areas do not have enough computers, with most of the time lacking Internet access or having slow connections. The educators do not have the needed training to educate their students on the usage of digital tools. This means that students struggle more in an attempt to learn as compared to the same students who study in schools where students are well prepared (Afzal et al., 2023). These issues are especially present in the case of the learners in rural or under-resourced schools. On the other hand, urbanized or other private school students are usually better acquainted with technology and more helpful in the work of their instructors. This gap proves that access to technology and the support that students will get out of the hands of teachers play a very significant role in the results of their learning process. The Digital Capital Theory assumes that possession of technology and the ability to utilize it a good asset (Chikwe et al., 2024). Lacking such resources, students find it more difficult to extract the advantages of having online education and, therefore, are deprived of many opportunities that can help them to become successful.

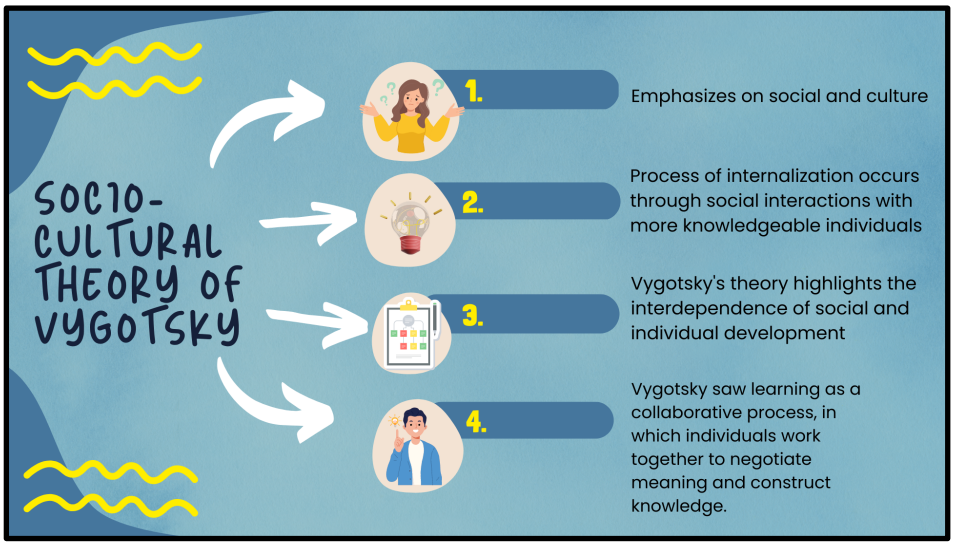

Figure 5. Application of Socio-Cultural Learning Theory in learning
(Source: Lybeck, Koiranen, & Koivula, 2024)

The Socio-Cultural Learning Theory also argues that learning is excellent when students interact with teachers and their fellow students. In case students cannot participate in online courses or engage in digital learning processes, they lose the interactions that are inalienable in knowledge, as well as self-confidence building. Educational institutions, teachers, and policy-makers should join their efforts to equip schools with devices, the Internet, and instructions (Lybeck, Koiranen, & Koivula, 2024). The provision of these resources will assist the learners to acquire knowledge better, stay motivated as well, and achieve their potential. Very digital learning implies ensuring that it is not only technological but also fair, opportunities, and accepted. The learners who possess the opportunities and support would be able to attain more results, acquire digital skills, and be better equipped to meet the challenges.

Theme 2: The Impact of the Digital Divide on Learners' Experiences and Outcomes

The digital divide affects the learning process of students and their success in education. The fact that certain students have sufficient access to devices, the internet, and online resources will allow them to learn effectively. They can attend online classes, ask questions, watch instructional videos, and do their homework on time (Elrayah & Alshiha, 2024). On the other hand, students who are not provided with such resources have difficulties with the accomplishment of tasks and understanding. The difference between the included and the excluded creates an education gap between the two disparities. It is often marginalizing to those students who lack the means of internet connectivity at home or devices. They cannot take part in online discussions, do assignments, or use other online educational tools. As a result, they will feel frustrated or stressed, or even demoralized. Education today has become digitalized, creating a digital divide that infringes on the level of access to higher education to which, by extension, creates discrepancies between the students of different classes with different socio-economic and geographical backgrounds (Gulzar, Mehmood, & Ahmad, 2024). All students who belong to rural regions and low-income status face the problem of gaining access to online learning theory, online libraries, and virtual classrooms, thus limiting their chances to receive education. These disparities were additionally established by the COVID-19 pandemic, when distance education turned multifunctional. This part discusses the problem concerning the digital divide and aims to find ways the difference can be minimized by government intervention in order to have equal opportunities to access higher education. It also analyses the implications of bringing in digitalization and blended learning in the education scene.

Digital divide is not a phenomenon and is a complex one since it is influenced by a plethora of factors, among them, the economic condition, place of residence, level of education, and access to technological infrastructure (Ben Youssef, Dahmani, & Ragni, 2022). The Socio-Cultural Learning Theory is based on the assumption that learners gain the best education when interacting with teachers and peers. People who cannot use digital tools do not receive such priceless interactions and are therefore limited to what they can learn. On the same premise, the Digital Capital Theory validates the inseparability of technology access and the skills needed to use technology in attaining success. There is severe underprivilege received by students who lack all these things. By so doing, every student will be able to have fun in learning, engage completely, and have high results. Alleviating the digital divide would ease an inclusive, equitable, and effective learning experience among all learners.

Theme 3: Challenges Hindering Equity and Accessibility in Digital Pedagogy

Although digital learning has brought numerous prospects, there are still numerous challenges that make the realization of complete equity and accessibility in primary and secondary school domains difficult. Lack of technology and accessibility is one of the major problems. Most students (particularly in rural or low family suburbs) lack quality internet, computers, and even places to study. This makes them less involved in web-based or combined learning sectors (Samarakkody et al., 2022). Another source of inequality is the cost of digital resources and information because not all families can afford to purchase laptops, tablets, or even internet packages.

The absence of trained teachers and digital skills is another great challenge. There are limited experiences of most teachers in using technology in a classroom. They may also be familiar with the digital tools but unaware of how the tools can be integrated into the lessons in order to meet the needs of different learners. Digital learning lacks consistency when no support or training is carried out, which makes the latter rather ineffective when it comes to students with special needs (Memon & Memon, 2025). Students and teachers are also susceptible to language barriers and digital illiteracy barriers. Not all information available online is provided as simple copy since some digital materials can only be understood in English or are very complex, with limited understanding of language or technical issues. In addition, the students

with disabilities also encounter problems in relation to accessibility since not every digital platform is inclusive and convenient to engage with the assistance of the devices.

Most policies and governments have very poor frameworks at the policy level of promoting equity in digital education. Although there are policies that promote the use of technology, they do not usually take into consideration the disparity of infrastructure or even the students' backgrounds. The result of this is an imbalanced implementation with the benefit proving to the urban schools rather than the rural schools (Amjad et al., 2024). Lastly, there exists a social and emotional rift that intensifies as they (students) feel lonely or not included in digital learning. The non-accessible people might become discouraged or demotivated, whereas others are quickly advancing using their resources (Gottschalk & Weise, 2023). These issues, including technical, financial, instructional, and emotional ones, are why the implementation of the digital mode of pedagogy does not always guarantee actual equity and accessibility.

Theme 4: Strategies and Interventions to Promote Equity and Bridge the Digital Divide

Schools and policymakers should work towards employing comprehensive strategies and long-term interventions to improve the existing digital learning system by making it more equitable and accessible. The initial one is to ameliorate the access and infrastructure. To provide students in isolated locations to have affordable internet access, low-priced devices, and solar-powered student learning centers, governments and other non-governmental organizations can collaborate. This makes each learner have the bare minimum with regard to engaging in digital learning (Khan, 2024). Of the utmost importance is teacher training. Learning institutions are expected to invest in professional development courses that can offer instruction to educators to develop the ability of innovative and inclusive usage of technology inclusively. The practitioners need to understand how to utilize digital assignments to help students with disabilities and those who possess low reading and writing competencies. The digital divide refers to the gap between individuals without access to modern information and communication technology. This divide manifests in unequal access to digital resources in educational contexts, exacerbating learning disparities among students from different socioeconomic backgrounds. Addressing this issue is crucial to fostering inclusive and equitable education. The digital divide continues to hinder educational opportunities for low-income students, limiting access to technology and digital resources (Khasseh & Jatoi, 2022).

This study examines socioeconomic disparities in access to educational technology, identifies key barriers, and assesses strategies to bridge the gap. This article synthesizes effective interventions by systematically analyzing literature, policy frameworks, and case studies, including infrastructure expansion, affordable technology programs, digital literacy training, and community-based initiatives. It also examines government policies and private-sector contributions to promoting digital equity. The findings offer a comprehensive understanding of current efforts, highlighting financial constraints and implementation hurdles (Turin et al., 2022). This study provides actionable insights for educators, policymakers, and stakeholders seeking to ensure equitable access to educational technology, thereby fostering inclusive and sustainable digital learning environments. Schools are supposed to provide statistics on opportunities and participation of students to identify the disadvantaged ones (Raihan et al., 2025). Such coordination of strategies mobilizing infrastructure, pedagogical strategies, interesting content, and future-driven policies can impact the digital closure in a positive way, making the digital pedagogical strategy a fair method to use regardless of geographical location or origin.

5. Conclusion

This study demonstrates that digital equity in primary and secondary education extends beyond the mere provision of devices and internet access. Genuine equity requires the development of students' digital literacy, teachers' technological competence, supportive

learning environments, and the mitigation of socioeconomic disparities. The digital divide encompasses not only infrastructural access but also economic affordability, relevant content, and the skills necessary to meaningfully engage with digital learning. Policy implications emphasize sustainable funding for equitable digital infrastructure, culturally responsive and accessible content, and cross-sector collaboration among governments, communities, and private stakeholders. Practically, schools should implement inclusive digital pedagogy, continuous teacher professional development, blended learning models, assistive technologies, and community-based digital literacy programs. While digital technologies can enrich learning experiences and diversify access, they are not substitutes for quality teaching and may exacerbate inequalities if poorly implemented. A strategic, inclusive, and culturally sensitive approach is therefore essential to ensure that all students benefit from digital transformation.

This study relies on secondary qualitative data and international case studies (2020–2025), which may limit contextual specificity and generalizability. Future research should examine the effectiveness of specific digital interventions, long-term socioeconomic impacts of digital disparities, and emerging forms of digital divide, particularly in the Global South. Further investigation into adaptive learning platforms, gamified instruction, and AI-driven pedagogy is also recommended to generate evidence-based strategies for advancing equitable digital education.

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