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IMPACT OF DIGITAL LEARNING ON PRIMARY EDUCATION IN BANGLADESH

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ABSTRACT

This study examines the effects of digital learning on primary education in Bangladesh, with specific emphasis on the obstacles encountered by teachers, parents, and children in adjusting to technology-driven methodologies. In response to the COVID-19 pandemic, the Bangladesh government, as part of its Digital Bangladesh strategy, implemented several digital learning technologies, including televised courses and radio broadcasts, to maintain educational continuity during school closures. Access to these technologies has been impeded by several socio-economic and infrastructural obstacles, including inconsistent electricity, restricted device availability, and inadequate digital literacy, especially in rural regions. This study rigorously analyses the practical consequences of these digital transformations and reveals significant barriers that impede effective learning. The study emphasizes the significance of establishing a supportive environment comprising dependable infrastructure, enhancement of teacher capabilities, and community engagement. It also indicates that marginalized populations, such as girls and children with impairments, encounter heightened risks of exclusion from digital education. The research reveals the necessity for context-specific tactics to address the digital divide, highlighting the significance of inclusive policies that combine technology with conventional learning techniques. The work enhances the field by delivering novel insights into the socio-technical dynamics of digital education within a developing country environment, presenting significant implications for policymakers, educators, and future researchers seeking to enhance digital learning outcomes.

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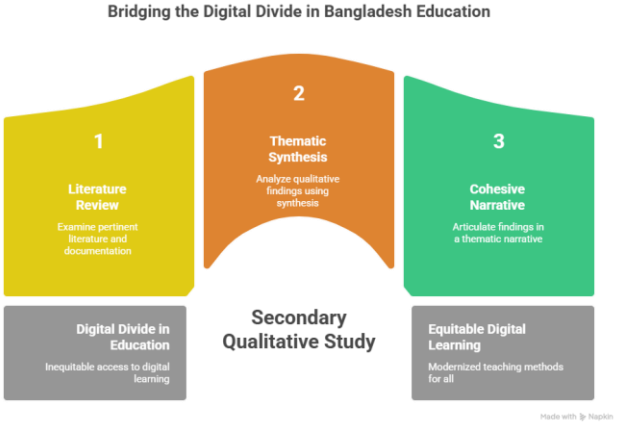
1 Introduction

In Bangladesh, primary education has progressively integrated digital learning into national strategies, particularly following the coronavirus outbreak. Initial program initiatives encompassed televised instruction (e.g. Sangsad Television broadcasts) and radio-based education (UNESCO, 2020). The government's Digital Bangladesh initiative and ventures such as Muktopaath offered interactive content for students. The objective was to maintain educational continuity during school closures and to modernize teaching methods. This transition has not been without debate. Certain critics assert that technology can democratize access (e.g., Peterson, 2019), whilst others warn that "we are not doing anything for most children" if they lack connectivity or support (Paul, Dauby, & Islam, 2024, p. 12). Recent qualitative studies from Bangladesh highlight a "digital divide" in education (Bhattacharjee et al., 2021; Ali, Rahman, & Sultana, 2023). Stakeholders' express apprehensions over inequitable access in rural regions, parents' capacity to support home-based learning, and educators' preparedness to provide online education (Paul et al., 2024; Rahman & Hossain, 2022). In this context, we conduct a secondary qualitative study of the available literature on digital learning in elementary school in Bangladesh. The user did not specify the study questions, and they remain unspecified here; instead, we concentrate the analysis on comprehending stakeholder experiences and interpretations from the published stories. The focus is mainly on Bangladesh, while we reference foreign cases when necessary to elucidate local findings. The given time frame is ambiguous, while several publications concentrate on the epidemic period.

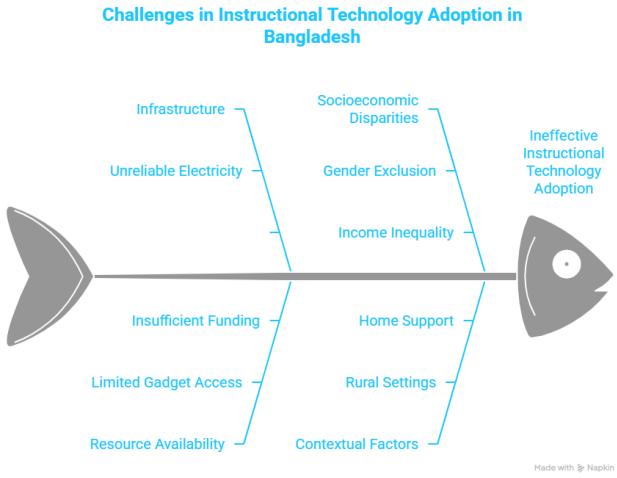
Figure 1: Bridging the Digital Divide in Bangladesh Education



2 Literature Review

The literature on instructional technology in Bangladesh and comparable contexts underscores a blend of potential and obstacles. Extensive global research indicates that well-designed digital technologies in elementary education can enhance access and engagement (Selwyn, 2013; Peterson, 2019; UNESCO, 2023). Nonetheless, context is significant. Researchers in Bangladesh indicate that availability to gadgets and dependable electricity constitutes a significant obstacle (Ali et al., 2023; Roy, Sunny, & Habibullah, 2025). A rural Bangladeshi educator notes, "as it is a village, we do not get electricity all the time" (Roy et al., 2025, p. 4), exemplifying how infrastructure constrains technological use. UNESCO (2021) similarly observes that digital disparities are apparent in nations with inadequate power infrastructure and network accessibility.

Figure 2 : Challenges in Institutional Technology Adoption in Bangladesh



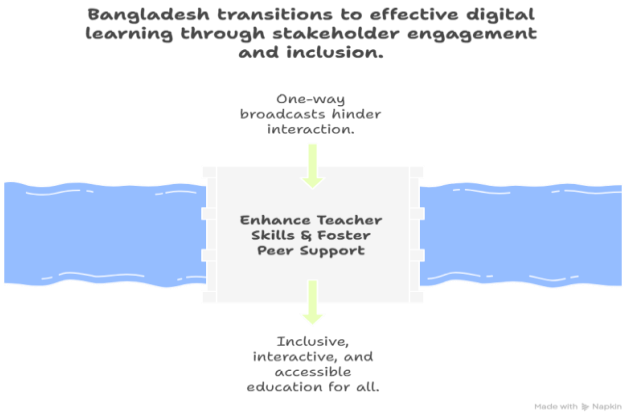
Studies also reveal disparities related to gender and socioeconomic status. Paul et al. (2024) indicate that numerous households were unable to buy televisions, resulting in greater exclusion for girls, who often had less leisure time for communal gadgets. Participants in that study report: "My daughter's education was on the verge of cessation because… we lacked a television, and we could not afford to purchase one" (Paul et al., 2024,

p. 9). This corroborates findings from other low-income contexts: girls and impoverished children disproportionately disengage from digital programs when home support is required (Annamalai, 2018; Bansal, 2019).

The COVID-19 epidemic initiated targeted activities in Bangladesh. The Ministry of Education initiated televised lessons, while UNESCO collaborated on a national radio curriculum (UNESCO, 2020). Initial assessments of these projects highlighted extensive reach but minimal engagement: an examination of Bangladesh's radio lectures indicates they are "one-way" broadcasts that connect with marginalised students yet restrict feedback (UNESCO, 2020). Global advice (e.g., UNESCO, 2020) anticipated that hybrid models may last beyond the epidemic, and several Bangladeshi educators endorsed the continuation of radio or television courses to "facilitate multiple avenues of learning" (UNESCO, 2020). Evidence from educators in Bangladesh indicates inconsistent outcomes: some regard radio as "a highly effective medium for educating... students from marginalised families" (UNESCO, 2020, p. 5), whereas others perceive the absence of interaction and assessment as a significant drawback (Bhattacharjee et al., 2021; Paul et al., 2024). Researchers have initiated qualitative studies on stakeholders' experiences about this digital transition. Ali et al. (2023) conducted interviews with parents and educators in Bangladesh regarding home-based e-learning. Parents frequently lack the technical expertise or literacy necessary to assist their children, resulting in teachers assuming the dual role as motivators and instructors. Rahman and Hossain (2022) indicate that elementary educators and education officials have adopted new communication methods (e.g., WhatsApp groups, mobile phone conversations) but perceive themselves as "continuously learning many new technologies" in real time (p. 6). These studies emphasise that enhancing teacher ability and fostering peer support are essential for the efficacy of digital learning (Rahman & Hossain, 2022; Roy et al., 2025).
Disability inclusion is a burgeoning issue in the literature. Bhattacharjee, Hossain, and Shiblee (2021) detail Bangladesh's Accessible Reading Materials (ARM) initiative, which digitised textbooks for visually impaired pupils. Following the implementation of ARM, one educator remarked: "Before the pandemic, obtaining accessible study materials was occasionally challenging; however, post-pandemic, these resources became readily available through various online platforms" (p. 13). Students with impairments report increased independence; one student notes transitioning to multimedia talking books on a phone "because the [Braille] books are too cumbersome to transport" (Bhattacharjee et al., 2021, p. 13). The qualitative findings indicate that digital learning techniques must explicitly accommodate the demands of impaired learners through design and infrastructure (Bhattacharjee et al., 2021).

Finally, official reports and grey literature provide context. The Global Education Monitoring report by UNESCO (2023) advises caution, stating that the mere provision of technology does not ensure learning in the absence of supported pedagogy. The Education Ministry of Bangladesh acknowledged that "sustained learning during closures" was a priority; nevertheless, the assessment of these initiatives is yet unfinished (Bangladesh Education Board, 2021). The literature collectively suggests that although technology-enabled learning holds promise, its implementation in Bangladesh has been inconsistent and largely dependent on local circumstances (Ali et al., 2023; Paul et al., 2024; Rahman & Hossain, 2022; Bhattacharjee et al., 2021).

Figure 3: Bangladesh Transitions Effective Digital Learning through Stakeholder Engagement and InclusionInclusion



3 Methodology of the Study

We performed a qualitative thematic synthesis of secondary materials. Eligible materials were located by focused searches in academic and policy databases (e.g., Google Scholar, university repositories) utilising keywords such as "Bangladesh primary education," "digital learning," and "COVID remote education." We incorporated peer-reviewed qualitative studies, qualitative elements of mixed-methods research, published reports, books, official policy documents, and credible news articles containing interview snippets. We rejected any source that depended exclusively on numerical data, surveys, or quantitative analysis. All referenced sources are in English.

Two specific objectives guided the data extraction and synthesis:

i. To examine narratives and reported experiences of parents, teachers, and stakeholders concerning primary-level digital learning in Bangladesh.
ii. To identify cross-cutting themes that reflect enablers and barriers of digital learning in this context.

We regarded each source as a "study" and extracted qualitative findings, including author-reported themes, participant quotations, contextual descriptions, and methodological comments (sampling procedure, data collecting, analysis). For instance, Ali et al. (2023) executed interviews and focus groups in both rural and urban educational institutions; Roy et al. (2025) conducted interviews in a rural district; Rahman and Hossain (2022) performed telephonic interviews with educators and officials. These methodological details were recorded qualitatively (e.g., purposive sampling of educators, thematic coding analysis).

The data were coded in an iterative manner. We employed a thematic synthesis methodology (Thomas & Harden, 2008) by initially coding the results and quotations line-by-line, subsequently organising the codes into descriptive categories, and ultimately extracting analytical themes. This coding was executed manually in text format. Contradictions and conflicts among sources were observed to inform the analytical narrative. We maintained ENTREQ-style transparency in our reporting (Tong et al., 2012) and consistently reported on our interpretations, including instances where details were unspecified in the sources.

Tables 1 summarise the included sources, their characteristics, key themes, and methodological notes. (Unspecified details are indicated where data were missing.) The analysis strictly avoided any quantitative or statistical interpretation.

Source (Author, Year)	Type & Context	Key Themes	Method Notes
Ali, Rahman & Sultana (2023)	Journal article: Parents' & teachers' perspectives	Home-based learning challenges; parental involvement; student motivation; teacher adaptation	Interviews & focus groups in rural/urban Bangladesh; thematic analysis (purposive sampling of teachers and parents).
Paul, Dauby & Islam (2024)	Journal article: Policy initiatives during COVID-19	Awareness of broadcast programs; tech access constraints; gender and literacy gaps; teacher roles in community	Interviews with guardians, teachers, ED officials; inductive coding.
Roy, Sunny & Habibullah (2025)	Journal article: Rural primary school ICT adoption	Infrastructure reliability (electricity); training gaps; funding issues; teacher attitudes	Interviews and FGD in rural schools; narrative analysis.
Rahman & Hossain (2022)	Journal article (educ. dev. report): Teacher PD needs	Multi-channel teaching; collaborative groups; organisation and workload; reflective practice	Phone interviews with teachers/headteachers/education officers nationwide; thematic coding.
Bhattacharjee, Hossain & Shiblee (2021)	UNESCO report (IIEP): Disability-inclusive education	Accessible materials (ARM initiative); student independence; policy support; ICTs for inclusion	Literature review plus 13 key-informant interviews and 4 FGDs; findings structured by relevance, effectiveness, etc.
UNESCO (2020) *Story: Bangladesh brings education to the airwaves*	Organizational article: Radio learning program	Teacher creativity in radio pedagogy; student engagement stories; reaching marginalized students	Journalistic feature with quotations from a primary pupil and involved teachers.

Source (Author, Year)	Type & Context	Key Themes	Method Notes
The Business Standard (2021)	News feature: Multimedia classroom rollouts	Practical failures of technology rollout; infrastructure maintenance issues	Interviews with school administrators (e.g. headmasters) and officials, reported anecdotally.
MyJoyOnline (2021) [Deutsche Welle piece]	News feature: Rural–urban school divide	Motivation loss; economic hardship for learners; lack of home support	Interview quotes from rural parents and commentary on infrastructure gaps.

Table 1. Included sources with context and extracted qualitative emphasis.

We detected more than 80 coded statements from these sources. The analytic concepts outlined in the Findings were synthesised from these elements.

4 Findings

Our thematic synthesis produced five principal connected topics. We give each theme accompanied with illustrative excerpts and source citations.

Access and Infrastructure Constraints: Numerous sources indicate that material accessibility constrains digital learning. Insufficient equipment (televisions, radios, cellphones) and inconsistent electrical supply are prevalent challenges in rural regions. A rural guardian states that without a home television, she was unable to access broadcast lessons: “we didn’t have any television, and we couldn’t afford to purchase one.” Teachers and administrators similarly report frequent power outages: “Being a village, we do not have consistent electricity” (Roy et al., 2025). In Bangladesh's multimedia classrooms, hardware frequently malfunctioned: one headmaster expressed, "I repaired the projector numerous times, but the outcome was negligible," signifying persistent failures. These reports suggest that the mere deployment of technology is inadequate; reliable maintenance and infrastructure are also essential.

Home Becomes a Classroom – Parental Roles: As schools closed, education transitioned to the home, positioning parents as implicit facilitators. Nonetheless, numerous parents perceived themselves as inadequately prepared. In Ali et al. (2023), parents acknowledged their deficiency in technical and pedagogical understanding. According to one educator: “I routinely summoned all students to participate and endeavoured to engage their families to motivate their children to embrace digital learning.” This demonstrates teachers actively involving families. Parents in Space and Culture (2024) articulated their concerns: one mother remarked that her kid lacked a structured educational routine, stating, “My daughter’s education was on the verge of cessation due to our illiteracy; we did not possess a television…”. A Deutsche Welle story cites a rural mother: “My daughter has lost interest in studying since her school closed” (MyJoyOnline, 2021). These viewpoints suggest that home education frequently depends on the literacy and availability of parents, which may be limited in impoverished settings.

Engagement and Pedagogical Challenges: Maintaining children's engagement remotely has become a persistent issue. Educators expressed concerns that digital content alone may disengage young learners. A Bangladeshi elementary teacher stated, “Creating content and lesson plans for students via digital platforms was exceedingly challenging.” However, we were directed by our principal... Numerous educators observed the absence of interactive components (such as questions and feedback) in unidirectional media. In the UNESCO radio research (UNESCO, 2020), the program's teacher highlighted the importance of narrative and accessible examples: “I endeavour to forge a connection with students and typically employ familiar terminology and illustrations” (p. 4). Participants often identified insufficient classroom engagement as a deficiency. Bhattacharjee et al. (2021) observe concerns with assessment and learning outcomes in remote training. The statistics indicate that digital learning activities require customisation to sustain engagement, such as through compelling

narratives or home assignments, and that assessment systems necessitate modification.

Teacher Support and Collaboration: The results indicate that educators frequently pursued informal networks to enhance their competencies. Numerous individuals reported establishing WhatsApp or Facebook groups to exchange advice. Rahman and Hossain (2022) document a teacher stating, “I initiated a Facebook group shortly after the onset of school closures… through the exchange of knowledge and experiences, we can develop collectively.” Headteachers organised weekly online meetings: "We convene each week to exchange our experiences." Expert educators instruct us on emerging technologies. These initiatives supplemented formal training, which some deemed insufficient. Roy et al. (2025) reference a teacher expressing concern over the absence of good training programs in light of the urgency. This theme suggests that teacher learning during the disruption was predominantly autonomous and cooperative. Bhattacharjee et al. (2021) assert that digital learning policies must incorporate ongoing capacity-building rather than merely one-time workshops.

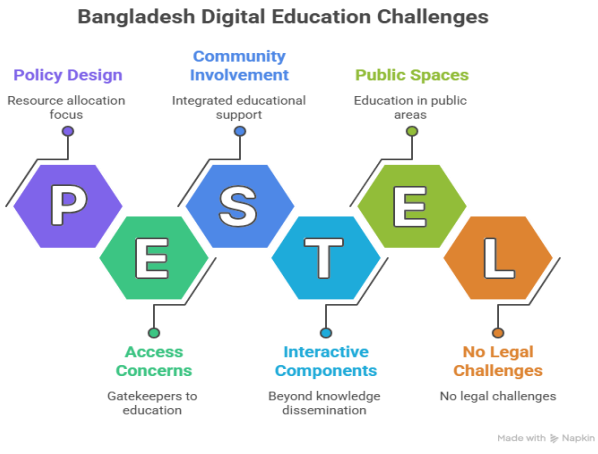
Equity and Inclusion: Issues pertaining to marginalised populations permeate all sources. Geographic disparity is underscored by the necessity for radio lessons: UNESCO (2020) indicates that 44% of families lacked televisions, hence necessitating the radio program. Thematic synthesis indicates that digital learning may marginalise pupils with disabilities, economically disadvantaged individuals, and girls in rural areas. A student with vision impairment stated in the disability report that ARM materials on her phone provided her with autonomy: “I utilised multimedia digital talking books and have been using these… through my Android phone.” This stands in contrast to previous difficulties in transporting Braille books. The article cites disability advocates advocating for a nationwide platform for accessible literature to serve all learners (Bhattacharjee et al., 2021). Gender stereotypes were highlighted in Space and Culture (2024): girls frequently faced additional duties and limited access to technologies, perpetuating the disparity. In conclusion, the statistics underscore that socioeconomic considerations are inextricably linked to technology; merely providing gadgets does not resolve these equality concerns.

These subjects are interconnected. For example, access to infrastructure and household mediation collaboratively influence engagement: a television broadcast may reach numerous houses (access), yet if students require parental assistance to comprehend it (mediation), learning is adversely affected. Teacher collaboration through support networks enhances pedagogical strategies to address engagement disparities. Equity issues overlap with all other themes by dictating who can genuinely profit from the technologies.

5 Discussion

Our summary provides a comprehensive perspective on Bangladesh's experience with primary-level digital education. The aforementioned themes indicate that although stakeholders perceive technology as a means to sustain education during disruptions, its practical implementation is considerably more intricate. Participants repeatedly assert that substantive learning necessitates more than mere knowledge dissemination; it demands interpersonal assistance and pertinent instructional design. Although a radio program may reach isolated youngsters, educators and parents assert that "one-way" courses require interactive components or subsequent engagement to be effective (UNESCO, 2020; Bhattacharjee et al., 2021). This reflects global apprehension that technology by itself does not guarantee education (UNESCO, 2023; Selwyn, 2013).

Figure 4: Bangladesh Digital Education Challenges

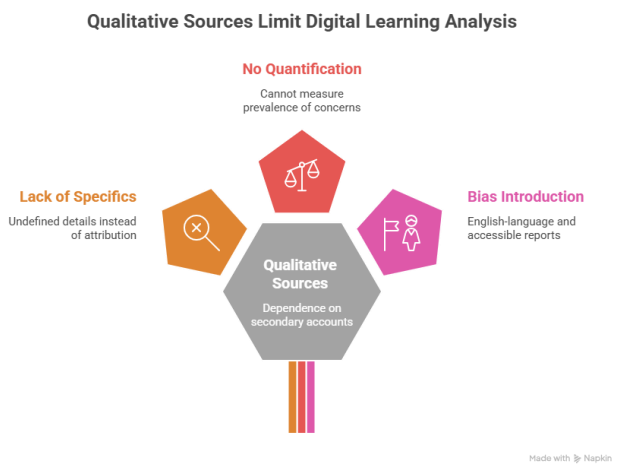


An essential understanding is the significance of social context. Comparing the various narratives, access concerns (Ali et al., 2023; Roy et al., 2025) and home environments (Paul and al., 2024) frequently served as gatekeepers. Even well-meaning initiatives, such as televised classes, can unintentionally exacerbate disparities if those who require them the most lack the resources to access them (Bhattacharjee et al., 2021; Paul et al., 2024). The synthesis indicates that digital projects should be integrated with community involvement, such as teaching parents (Ali et al., 2023) or offering public spaces for education (Paul et al., 2024). A practical implication for policy design is that resources may be more effectively allocated to low-tech inclusive tactics (e.g., radio, disseminated printed materials) in conjunction with technology, as the "digital" component cannot be separated from comprehensive educational support. Educators consistently observed that without teamwork, solitary technology training is ineffective (Rahman & Hossain, 2022; Roy et al., 2025). Consequently, programs should incorporate teacher peer networks and engage local stakeholders in content development.

Limitations

Dependence solely on secondary qualitative sources presents limitations. We are constrained by the accounts provided by other authors. Certain sources were deficient in specifics (e.g., precise sample frames were categorised as “purposive/unpublished”). We saw undefined details instead of attributing them. Our investigation was unable to quantify the prevalence of any concern; it solely reflects the interpretations of the interviewees. Incorporating quantitative data, had it been available, would have strengthened the analysis; nonetheless, it was deliberately excluded as per directives. Ultimately, language and publishing bias may exist, as we incorporated solely English-language and predominantly accessible reports.

Figure 5: Qualitative Sources Limit Digital Learning Analysis



We may have overlooked grassroots opinions not recorded in the existing literature. Notwithstanding these constraints, theme synthesis is adept in formulating theory and emphasising overlooked concerns (Thomas & Harden, 2008). This elucidates the how and why enquiries regarding digital learning that surveys alone could not resolve. Readers should understand the conclusions qualitatively: our findings indicate potential pathways (e.g., "parental illiteracy undermines broadcast lessons") rather than quantify the impact.

6 Conclusion

This study examined the incorporation of digital learning in primary education in Bangladesh, emphasising the experiences and obstacles faced by stakeholders such as parents, teachers, and policymakers. It was determined that although digital resources, including televised courses and radio programs, provided some educational continuity during school closures, their efficacy was limited by various socio-technical obstacles. These encompassed insufficient infrastructure, unreliable electrical supply, and restricted access to essential gadgets, especially in remote regions. Moreover, some parents encountered difficulties in facilitating their children's education owing to insufficient technical expertise and reading skills. The study underscores that for digital learning to achieve genuine inclusivity, it necessitates a supportive ecosystem comprising adequate infrastructure, teacher capacity-building, and active community engagement. The research underscores the significance of socio-economic determinants, indicating that vulnerable populations, like girls and children with disabilities, are at an elevated risk of being marginalised. The study indicates that although digital learning can significantly enhance education, its effectiveness in Bangladesh depends on tackling systemic disparities and ensuring that technical solutions are adapted to the local context. Future study should examine the long-term impacts of digital learning on educational outcomes and analyse measures to mitigate the digital divide, guaranteeing fair access to quality education for all students.

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