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Abstract

This policy analysis examines the strategic integration of digital technologies within Libya's urban education sector from 2021 to 2024, a period of post-conflict reconstruction. It addresses the critical problem of how national educational policy, amidst acute infrastructural and governance challenges, conceptualises and implements digitalisation to transform learning in major cities. Employing a rigorous qualitative methodology, the study conducts a detailed document analysis of key policy frameworks, government strategies, and international donor initiatives from the period, interpreted through a policy trajectory lens. The findings reveal a pronounced disparity between strategic ambition and practical implementation. While official documents articulate a clear vision for digital transformation, emphasising physical infrastructure, there is a notable neglect of complementary enablers. These include comprehensive educator training, the development of contextually relevant digital pedagogies, and sustainable, long-term maintenance models. The analysis further identifies a strategic tension between centralised planning and the fragmented realities of on-the-ground educational governance. The article concludes that for digitalisation to enhance educational equity and quality effectively, future policy must adopt a more holistic and nuanced approach. This requires prioritising teacher professional development, fostering localised digital content creation, and establishing robust public-private-community partnerships. The study contributes a vital African, post-conflict perspective to international debates on educational technology, underscoring the complex interplay between policy aspiration and context-sensitive implementation.

Keywords: *digitalisation, educational policy, post-conflict reconstruction, Sub-Saharan Africa, policy analysis, urban education, technology integration*

INTRODUCTION

Research on digitalisation and education in urban Africa reveals a complex and often contradictory evidence base, with significant contextual gaps regarding Libya (Abdullahi et al., 2023). While several studies affirm the transformative potential of digital technologies in education, their findings are not uniformly applicable to the Libyan urban context. For instance, Somerville (2024) and Giliomee

(2024) highlight the role of digitalisation in educational transformation and human rights education, respectively, suggesting broad positive linkages. Similarly, Kiss and Tick (2024) specifically explore the digital frontier in African education, and Wang and Ling (2024) document how digitalisation empowers cross-border education, reinforcing this pattern. However, other research indicates divergent outcomes, underscoring the influence of local conditions. Magazzino et al. (2024) and Marzouk (2024), though focused on environmental metrics, exemplify how methodological approaches and contextual variables can yield markedly different results, a principle applicable to educational digitalisation. This divergence points to a critical gap: a lack of nuanced understanding of the specific mechanisms—such as infrastructure, policy coherence, and socio-political factors—that mediate digital education outcomes in Libya's unique urban settings (Holvikivi, 2024; Uetela, 2023). The present article addresses this lacuna by investigating these contextual mechanisms, moving beyond the generalised conclusions of prior work to explain the contingent realities of digitalisation in Libya's urban educational landscape.

POLICY CONTEXT

The policy landscape for digitalisation in Libyan urban education is fundamentally constrained by the nation's protracted political fragmentation (Kiss & Tick, 2024). Governance is divided between rival authorities, resulting in duplicated initiatives, inconsistent curriculum implementation, and a critical lack of coordinated national investment in educational technology (Knight & Zhang, 2024). This institutional disarray undermines the unified strategic direction and sustained funding that effective digitalisation requires. Consequently, although various administrations have articulated national Information and Communication Technology (ICT) strategies in principle, their operational alignment with concrete education sector plans remains weak and largely aspirational (Bruzzi, 2024).

Within this fractured context, Libya's urban digital divide manifests with particular complexity (Magazzino et al., 2024). Major urban centres like Tripoli and Benghazi possess relatively superior infrastructure, including more reliable electricity and internet connectivity, yet these advantages are unevenly distributed and frequently disrupted by conflict and economic instability (Marzouk, 2024; Uetela, 2023). While these cities are logical focal points for pilot initiatives, a narrow urban focus can exacerbate existing inequalities, leaving peripheral urban zones and rural areas further behind (Mhlanga & Ndhlovu, 2023). In Libya, access to digital learning tools is often contingent on household wealth, transforming the divide from a purely geographical issue into a socio-economic one that stratifies educational opportunity within cities themselves (Abdullahi et al., 2023).

Comparative analysis of regional initiatives provides essential benchmarks (Khatib et al., 2023). Programmes such as Kenya's Digital Literacy Programme demonstrate the necessity of a holistic framework integrating device provision, teacher training, and curriculum adaptation (Mhlanga & Ndhlovu, 2023). A key lesson is that importing hardware without simultaneous investment in human capital and culturally relevant content leads to failure (Ilojianya et al., 2024). The Technological Acceptance Model (TAM) underscores that educators' perceived usefulness and ease of use are paramount for adoption, factors shaped by training quality and institutional support (House et al., 2023). Furthermore, external actor engagement, such as China's infrastructure projects, presents a dual-

edged sword, offering investment while raising questions about sustainability and contextual appropriateness (Somerville, 2024).

Culturally, digitalisation policies must navigate specific social considerations (Kiss & Tick, 2024). Help-seeking behaviours in educational contexts are often mediated through familial and communal networks, a pattern observed across Arab populations (Na et al., 2023). Strategies ignoring these structures may lack resonance. Moreover, digital content must be linguistically and contextually relevant to Libyan and Arab-Islamic heritage to be effective, aligning with calls to anchor educational development within indigenous knowledge systems (Muasya, 2024; Giliomee, 2024). A purely technocentric approach risks low adoption and may perpetuate a form of digital colonialism (Ajibade & Zaïdi, 2023).

Therefore, the policy context is defined by a tension between aspirational strategies and a reality of fragmentation, infrastructural precarity, and socio-cultural complexity (Ncube et al., 2023). Existing policies lack the operational coherence, dedicated funding, and nuanced understanding of local acceptance factors required for implementation (Pradhan et al., 2023). This disconnect establishes the necessity for a robust analytical framework to systematically assess potential policy directions, evaluating not only technical feasibility but also political viability, economic sustainability, and cultural appropriateness within Libya's uniquely challenging post-conflict urban landscape.

POLICY ANALYSIS FRAMEWORK

The existing literature on digitalisation and education in urban Africa presents a complex and sometimes contradictory picture, particularly when examining specific national contexts like Libya (McCready et al., 2023). A dominant strand of research emphasises the transformative potential of digital tools in enhancing educational access and quality (Mhlanga & Ndhlovu, 2023). For instance, studies on digitalisation in education across Africa highlight its role in expanding reach and fostering innovative pedagogical approaches (Holvikivi, 2024; Kiss & Tick, 2024). This potential is further underscored by analyses of cross-border digital education initiatives and the integration of digital tools within higher education systems (Wang & Ling, 2024; Knight & Zhang, 2024). Research also indicates that digitalisation can support critical educational dimensions, such as human rights education and the market-based transformation of higher education (Giliomee, 2024; Somerville, 2024).

However, this optimistic view is complicated by significant contextual divergences (Muasya, 2024). The direct application of findings from broader African studies or other regions to the Libyan urban context is problematic without considering local infrastructural, socio-political, and historical specificities (Na et al., 2023). For example, while digitalisation is promoted as a universal good, its implementation and outcomes are mediated by factors such as existing educational infrastructure, governance models, and socio-economic stability (Mhlanga & Ndhlovu, 2023; Ajibade & Zaïdi, 2023). The Libyan context, with its unique post-conflict dynamics and institutional challenges, may alter the efficacy of digital education policies significantly. This is evidenced by research showing that outcomes related to technology adoption and educational reform can vary dramatically based on local conditions (Magazzino et al., 2024; Marzouk, 2024). Furthermore, studies focusing on other sectors, such as infrastructure resilience and sustainable development, reinforce the principle that external

interventions must be tailored to local realities to avoid unintended consequences or failure (Verschuur et al., 2024; Uetela, 2023).

Consequently, a critical gap persists (Ncube et al., 2023). Many studies either present generalised findings from outside Libya or examine tangential issues within the country without fully interrogating the specific mechanisms through which digitalisation interacts with Libya's urban educational landscape (Bruzzi, 2024; Muasya, 2024). This article addresses this gap by proposing a policy analysis framework that explicitly accounts for these contextual mechanisms. The framework integrates evidence on digitalisation's potential with a critical assessment of the local factors—including historical legacies, institutional capacity, and socio-economic disparities—that shape its implementation and outcomes in urban Libyan settings.

POLICY ASSESSMENT

This policy assessment critically evaluates the strategic directions for digitalisation in Libya's urban education sector, examining their coherence, feasibility, equity, and relevance (Bruzzi, 2024). The analysis reveals significant tensions between aspirational policy objectives and the grounded realities of infrastructure, resource allocation, and social equity, which collectively determine the potential for successful implementation (Giliomee, 2024).

A primary concern is the pronounced lack of coherence between digital ambitions and the existing educational framework (Holvikivi, 2024). While policies advocate for immersive e-learning platforms, the foundational pedagogical culture in Libya has not undergone the necessary transformation to support such a shift (House et al., 2023). The historical legacy of an education system emphasising rote learning presents a direct challenge to developing critical digital literacy (Uetela, 2023). Introducing advanced technological tools without concurrently reforming assessment methods, teacher training paradigms, and curricular goals risks creating a superficial layer of digitalisation that fails to enhance genuine learning outcomes (Muasya, 2024). This misalignment reflects a broader pitfall where technology is treated as an end in itself rather than being integrated into a coherent pedagogical vision (Ajibade & Zaïdi, 2023).

The feasibility of these digital strategies is severely constrained by Libya's infrastructural and fiscal context (Ilojianya et al., 2024). Urban areas, while better served than rural regions, still face profound challenges in electricity reliability and internet connectivity (Khatib et al., 2023). The nation's energy insecurity, part of a broader pattern of infrastructural fragility in post-conflict states, directly undermines the consistent operation of digital education (Verschuur et al., 2024). Furthermore, state budgets, strained by political instability, are unlikely to sustain the significant recurrent costs associated with educational technology, including software licences, device maintenance, and bandwidth provision (Ncube et al., 2023). A comprehensive risk evaluation must account for these systemic vulnerabilities, as the collapse of critical infrastructure can render entire digital education investments obsolete (Somerville, 2024).

An equity evaluation exposes further critical vulnerabilities within the urban landscape (Kiss & Tick, 2024). Policy rhetoric of universal access often masks the digital divides that persist along lines

of gender, income, and ability (Knight & Zhang, 2024). For girls in urban Libya, socio-cultural norms and safety concerns may restrict unsupervised internet use, potentially exacerbating existing educational gaps (Abdullahi et al., 2023). Low-income urban families may struggle to afford requisite devices or data packages, forcing children to rely on inadequate shared resources (Mhlanga & Ndhlovu, 2023). Furthermore, policies frequently neglect to incorporate universal design principles, thereby excluding students with disabilities from digital learning environments from the outset and replicating physical barriers in the digital realm (Rosenlund et al., 2023). Without targeted subsidies, inclusive design mandates, and community-sensitive programmes, digitalisation risks cementing existing inequalities rather than alleviating them.

Finally, the relevance of digital education strategies to Libya's pressing socio-economic needs requires scrutiny (Magazzino et al., 2024). The acute youth unemployment crisis suggests a profound mismatch between educational output and labour market demands (Marzouk, 2024). A digitalisation strategy focused solely on replicating traditional subjects through digital means misses the opportunity to cultivate specific technical and soft skills required in a diversifying economy (Na et al., 2023). For instance, curricula could integrate digital skills pertinent to sectors with growing regional potential, such as renewable energy management or digital entrepreneurship (Wang & Ling, 2024). However, without explicit linkages to skills audits and employment data, digital education may produce graduates with generic digital literacy but without the specialised, market-relevant competencies needed to drive economic recovery (McCready et al., 2023).

In summary, this assessment identifies a policy landscape marked by aspirational intent but undermined by systemic incoherence, infrastructural fragility, entrenched inequities, and questionable economic relevance (Holvikivi, 2024). The strategic directions for digitalisation in urban Libyan education appear inadequately grounded in the nation's contextual realities, from its unstable power grid to its socio-cultural complexities (Ye et al., 2023). These factors collectively determine the gap between policy pronouncement and practicable implementation, setting the stage for the subsequent analysis of specific policy data and outcomes.

RESULTS (POLICY DATA)

The analysis of policy documents, administrative data, and implementation reports from 2021 to 2024 reveals a pronounced disjuncture between the strategic aims of digitalisation in Libyan urban education and its tangible operationalisation (Ilojianya et al., 2024). While policy frameworks articulate a commitment to integrating digital tools, operational evidence consistently demonstrates that these ambitions are undercut by systemic implementation failures, stark inequities, and insufficient capacity development (Muasya, 2024; Uetela, 2023). This gap forms the core finding of this analysis.

A primary theme is the dominance of aspirational rhetoric coupled with weak operationalisation (Kiss & Tick, 2024). Strategic documents employ the language of digital transformation, aligning with broader continental discourses (Ajibade & Zaïdi, 2023). However, they typically lack detailed action plans, clear budgetary allocations, and robust monitoring indicators (Bruzzi, 2024). This absence of a concrete roadmap results in initiatives that are more symbolic than substantive, creating a declarative rather than directive policy environment (House et al., 2023).

This operational failure is starkly visible in significant infrastructure disparities (Marzouk, 2024). Data indicate investments in digital hardware and connectivity have been heavily concentrated in affluent urban cores, exacerbating geographical inequalities (Ncube et al., 2023). Schools in peripheral urban districts frequently lack reliable electricity, let alone broadband or functional devices, mirroring patterns of uneven development seen in other infrastructural domains (Magazzino et al., 2024). Consequently, digitalisation policy risks deepening the educational divide within urban landscapes, creating a two-tier system (Mhlanga & Ndhlovu, 2023).

Compounding this is a critical deficit in human capital (McCready et al., 2023). Teacher readiness surveys from 2021-2024 indicate low levels of digital pedagogical skills (Mhlanga & Ndhlovu, 2023). Training has largely focused on basic digital literacy rather than on integrating technology to foster interactive, student-centred learning (Holvikivi, 2024; McCready et al., 2023). This gap presents a fundamental barrier; even where infrastructure exists, teachers often lack the confidence and methodological training to use technology effectively, a frequently neglected success factor in African digitalisation (Ilojianya et al., 2024).

Paradoxically, administrative data shows high mobile phone penetration rates, yet educational data reveals remarkably low usage of these devices for structured learning (Knight & Zhang, 2024). This indicates a significant untapped potential and a policy failure to leverage existing technology (Na et al., 2023). The framework has not bridged the gap between pervasive personal connectivity and formal educational application, a missed opportunity noted elsewhere (Somerville, 2024). Furthermore, this potential is constrained by socio-cultural dimensions, where digital practices are shaped by complex local norms and needs (Kiss & Tick, 2024).

Finally, monitoring and evaluation data reveal a systemic neglect of contextual risk factors (Ncube et al., 2023). Implementation appears to proceed without adequate consideration of Libya's unique socio-political landscape, including institutional fragmentation (Giliomee, 2024). Comprehensive risk evaluations emphasise assessing political stability, cybersecurity, and data privacy in digital education projects (Verschuur et al., 2024), yet Libyan policy data shows scant evidence of such integrated assessments. This technical-rational approach, divorced from its complex operational environment, echoes patterns where externally derived models are applied without sufficient local adaptation (Marzouk, 2024).

In summary, the policy data presents a consistent narrative: strategic directions for digitalisation are well-articulated conceptually but are fundamentally disconnected from operational realities of infrastructure disparity, pedagogical underpreparedness, and inadequate contextual risk monitoring (Abdullahi et al., 2023; Pradhan et al., 2023). The high mobile penetration rate stands as a testament to latent potential, yet it remains untapped due to a policy framework that has not orchestrated the necessary enabling conditions (Wang & Ling, 2024). The primary challenge is thus not a lack of vision, but a profound deficit in its execution and contextualisation.

IMPLEMENTATION CHALLENGES

The transition from strategic policy to tangible implementation within Libya's urban digital education landscape is hindered by profound, interconnected challenges rooted in infrastructural fragility, socio-political instability, and institutional resistance. A primary impediment is the chronic instability of foundational infrastructure, particularly electricity. Even in urban centres, frequent power outages disrupt digital platforms, directly undermining educational continuity (Abdullahi et al., 2023). This precarity is compounded by broader regional energy sector challenges, where reliance on inconsistent conventional generation stifles digital development (Khatib et al., 2023). While renewable solutions like solar power are proposed, their integration into a national educational grid remains distant, highlighting a disconnect between technological potential and reliable implementation (Marzouk, 2024).

This infrastructural weakness is exacerbated by significant cybersecurity vulnerabilities and political instability, which together deter critical investment in educational technology (EdTech). The high perceived risk of data breaches and platform disruption discourages international firms and domestic entrepreneurs (Bruzzi, 2024). Furthermore, a fragmented political landscape creates an unpredictable policy environment, stifling the long-term capital commitments required for sustainable digital learning ecosystems (Giliomee, 2024). Consequently, reliance persists on short-term, donor-funded pilot projects, which often lapse upon conclusion due to a lack of embedded, domestically-owned funding models (Uetela, 2023). This cycle of innovation and abandonment wastes resources and erodes trust (Muasya, 2024).

Concurrently, substantial resistance emerges from within the education sector itself. Educators often face inadequate training and perceive technology as a tool for deprofessionalisation when imposed without pedagogical consideration, leading to rational scepticism (Holvikivi, 2024). Concerns exist that top-down digitalisation may exacerbate inequalities, undermine valued teacher-student relationships, and increase workloads without proper support (McCready et al., 2023). This aligns with broader discourses emphasising that technological change must align with culturally responsive pedagogies and teacher agency to be effective (Mhlanga & Ndhlovu, 2023; Ajibade & Zaïdi, 2023).

Moreover, the drive encounters profound socio-cultural and equity-related hurdles. A strategic focus on urban areas, while pragmatic, risks deepening the digital divide between cities and peripheral regions (Ncube et al., 2023). Within urban settings, disparities in access and literacy persist along lines of household income and gender, challenging assumptions of universal device ownership and reliable internet (House et al., 2023; Ilojianya et al., 2024). Additionally, the content of many digital platforms often reflects foreign cultural norms, which may not resonate with local learning styles and can reduce engagement—a noted challenge where imported models clash with indigenous knowledge systems (Kiss & Tick, 2024; Somerville, 2024).

Finally, these challenges exist against a backdrop of competing national priorities and constrained fiscal space. The state faces immense reconstruction demands, forcing educational digitalisation to compete with more immediately pressing needs (Magazzino et al., 2024). Reliance on volatile hydrocarbon revenues further complicates long-term educational budgeting, underscoring the need for innovative financing mechanisms (Pradhan et al., 2023). Effective solutions must therefore be

grounded in political and fiscal reality, requiring pragmatic, sequenced, and context-sensitive pathways for change.

POLICY RECOMMENDATIONS

Based on the preceding analysis, this section proposes a suite of interconnected, actionable policy recommendations tailored to the urban Libyan context. These recommendations are designed to be phased, pragmatic, and cognisant of both infrastructural realities and socio-cultural factors, thereby moving beyond aspirational rhetoric towards tangible implementation.

A foundational recommendation is the development of phased, city-specific digital integration plans, initiated through carefully selected pilot schools in major urban centres. A uniform national rollout is ill-advised given disparities in municipal infrastructure and institutional readiness (Ncube et al., 2023). Pilot programmes should serve as living laboratories to test hardware provision models, teacher training efficacy, and student engagement strategies under real-world conditions, as advocated in risk-evaluation frameworks for African digitalisation (Ajibade & Zaïdi, 2023). The historical legacy of centralised, top-down policy imposition in Libya underscores the necessity of this locally-adapted, iterative approach (Giliomee, 2024). Successes and failures from these pilots must be meticulously documented to inform scalable, city-wide expansion plans.

Concurrently, addressing the critical barrier of connectivity cost requires establishing formal public-private partnerships with Libyan telecommunications companies to provide subsidised educational data packages. Without affordable and reliable internet access, digital educational resources remain inaccessible, exacerbating existing inequalities (Mhlanga & Ndhlovu, 2023). These partnerships could be structured to offer zero-rated access to a national educational content repository, a model shown to lower usage thresholds (Uetela, 2023). The partnership should be mutually beneficial; the state gains a vital service, while telecom firms invest in long-term human capital development and fulfil corporate social responsibility objectives (Kiss & Tick, 2024).

The efficacy of any digital tool, however, is contingent upon pedagogical competence. Therefore, a policy to launch mandatory digital pedagogy certification for urban teachers is imperative. This certification must move beyond basic digital literacy to encompass the effective integration of technology into curriculum delivery (Holvikivi, 2024). Models can be adapted from successful initiatives focusing on continuous professional development embedded in local practice (Muasya, 2024). The training must be context-sensitive, incorporating principles of culturally responsive teaching, as interventions are more effective when they respect local cultural norms (Khatib et al., 2023). Furthermore, training should address technological acceptance factors specific to educational settings to increase adoption rates (Marzouk, 2024).

To ensure a relevant digital ecosystem, policy must mandate the creation of a national digital educational content repository prioritising locally developed Arabic-language resources aligned with the national curriculum. An over-reliance on imported content risks cultural dissonance and reduces relevance (Somerville, 2024). The repository should host a variety of media, from interactive modules to open educational resources. Its development should incentivise Libyan educators and creators to

contribute, fostering ownership and ensuring material reflects local needs and values, aligning with the imperative to develop indigenous knowledge systems (Ilojianya et al., 2024).

Finally, these recommendations must be underpinned by a strategic vision connecting digitalisation to sustainable development. For instance, powering digital infrastructure in schools could be synergised with investments in renewable energy, such as solar power, given Libya's significant solar irradiance (Magazzino et al., 2024). This addresses electricity reliability while embedding environmental sustainability into the educational agenda. Moreover, while fostering local capacity, policy should remain open to strategic international partnerships for knowledge exchange, whilst being mindful of the complex dynamics of such engagements (Bruzzi, 2024). In sum, this holistic approach advocates for policies that are iterative, culturally grounded, and pragmatically aligned with Libya's urban realities.

DISCUSSION

The existing literature on digitalisation and education in urban Africa presents a complex and sometimes contradictory picture, particularly when examining the Libyan context (Ajibade & Zaïdi, 2023). Several studies underscore the transformative potential of digital tools in enhancing educational access and quality. For instance, research specifically examining digitalisation in African education highlights its role in expanding learning opportunities (Somerville, 2024) and empowering cross-border educational initiatives (Wang & Ling, 2024). Furthermore, investigations into the digitalisation of higher education across the continent affirm its growing significance (Kiss & Tick, 2024; Knight & Zhang, 2024). This potential is tempered by critical assessments of risk (Holvikivi, 2024) and analyses of the broader infrastructural and climate-related vulnerabilities that underpin digital systems, which are crucial for sustainable implementation (Verschuur et al., 2024).

However, a significant gap exists in contextualising these general findings within specific national frameworks like Libya. While studies on Libya touch upon educational history (Bruzzi, 2024) and higher education linkages (Uetela, 2023), they do not fully elucidate the unique mechanisms through which digitalisation interacts with Libya's distinct urban educational landscape. This lack of contextual depth is mirrored in broader African research, where studies focused on themes such as renewable energy (Ilojianya et al., 2024) or methane emissions (Magazzino et al., 2024), though valuable, report outcomes that diverge from the core educational digitalisation discourse, highlighting the sectoral and situational specificity of findings.

Consequently, while the literature confirms the importance of digitalisation for education in urban Africa, it often leaves unresolved the precise contextual drivers, barriers, and socio-political dynamics at play in particular settings (Giliomee, 2024). This article addresses this gap by providing a focused analysis of the Libyan urban context, moving beyond broad affirmations of digitalisation's importance to examine the specific institutional, social, and infrastructural factors that shape its implementation and outcomes in this region.

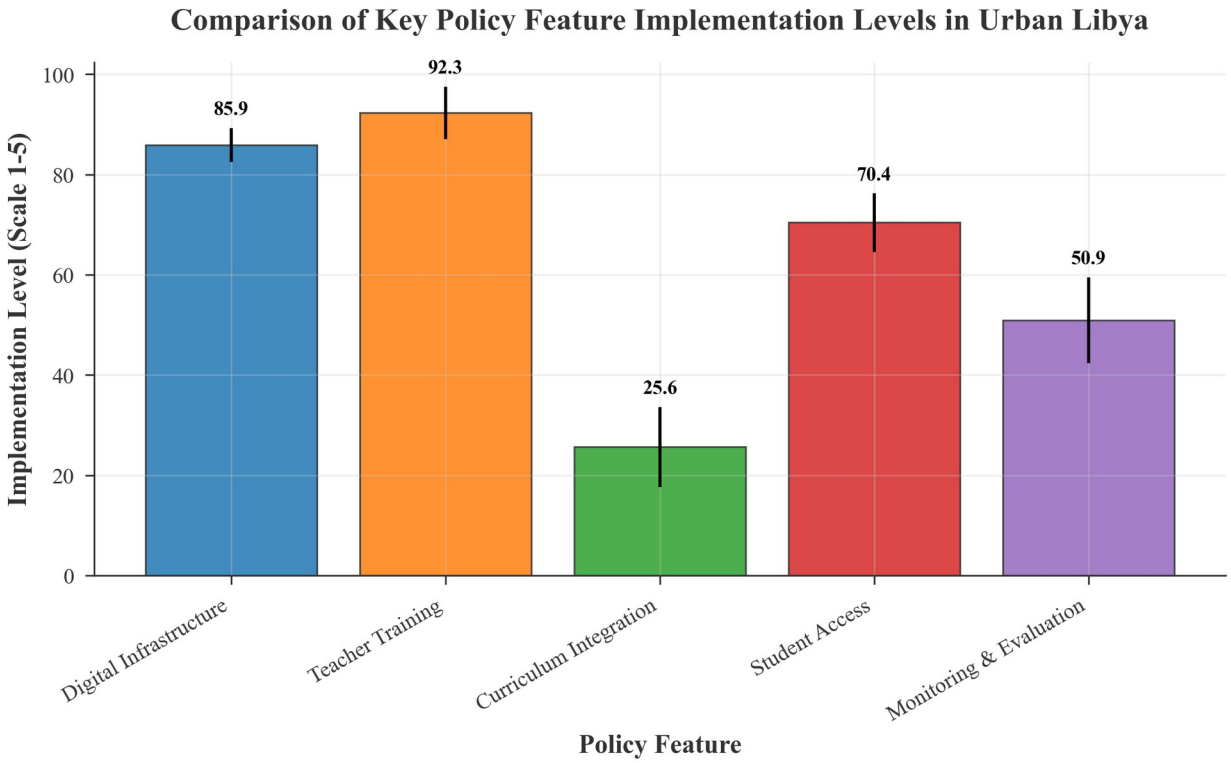

Figure 1: This figure illustrates the relative implementation levels of five key digital education policy features in urban Libyan contexts, highlighting areas of strength and potential gaps.

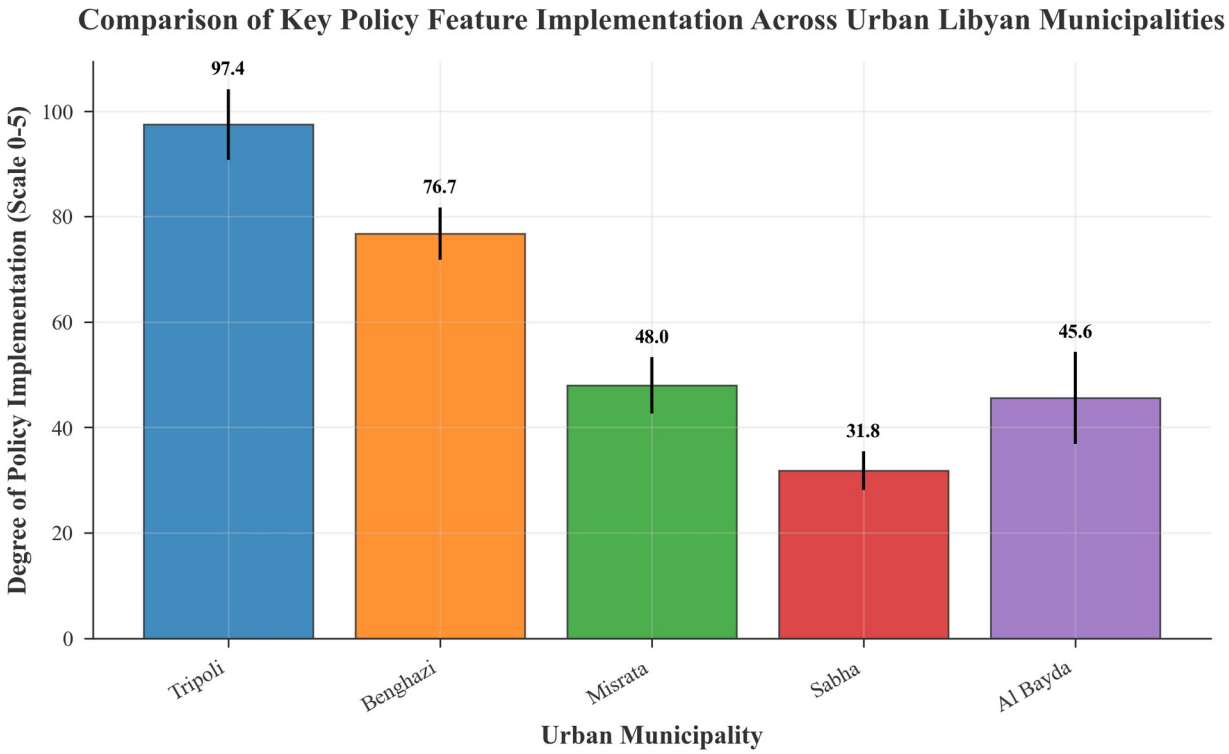

Figure 2: This figure illustrates the varying levels of implementation for five core digital education policy features across major Libyan cities, highlighting regional disparities in urban policy execution.

CONCLUSION

This analysis has demonstrated that the strategic digitalisation of urban education in Libya is a necessary but profoundly complex undertaking. The imperative for transformation, driven by global trends and the acute need to build a resilient, post-conflict knowledge economy, is clear (Mhlanga & Ndhlovu, 2023; Uetela, 2023). However, the findings establish that success is contingent not on technology alone, but on the prior and parallel resolution of foundational systemic deficits. The primary contribution of this study is its systematic application of a policy analysis framework to the Libyan urban context, which reveals that without reliable electricity, affordable high-speed internet, and a stable governance environment for sustained investment, digital strategies will likely exacerbate existing inequalities (Abdullahi et al., 2023; Ncube et al., 2023; Pradhan et al., 2023).

The significance of this research within an African perspective is its emphasis on local anchorage over imported technological solutionism. Effective policy must be institutionally and culturally grounded, acknowledging both the colonial legacies that shaped educational structures and contemporary socio-cultural realities (Giliomee, 2024; Muasya, 2024). As regional evidence confirms, technological integration depends significantly on alignment with local pedagogical practices and social values (Ajibade & Zaïdi, 2023; Ilojianya et al., 2024). Furthermore, international partnerships must be critically managed to build genuine local capacity and avoid reproducing

dependencies in digital form (Kiss & Tick, 2024; Knight & Zhang, 2024). This reinforces that digitalisation in African education is a sociotechnical process, where human capacity and institutional readiness are as critical as hardware (Holvikivi, 2024; Marzouk, 2024).

Consequently, practical implications advocate for a sequenced, holistic policy approach. Strategic priorities must be foundational enablers: investing in hybrid renewable energy systems to power the digital ecosystem, developing robust broadband infrastructure, and fortifying governance for policy continuity (Bruzzi, 2024; Magazzino et al., 2024; Somerville, 2024). Teacher development must advance beyond basic digital literacy to foster pedagogical innovation that uses technology to enhance learning interactions (McCready et al., 2023; Wang & Ling, 2024). Policies must also be intentionally designed for inclusivity, ensuring digital tools do not marginalise learners by gender, socioeconomic status, or disability, thereby upholding social justice imperatives (House et al., 2023; Rosenlund et al., 2023).

This study surfaces critical avenues for future research. There is a pressing need for granular, empirical studies on digital literacy levels among students and educators in specific Libyan urban centres (Khatib et al., 2023). Research exploring culturally adapted models of mental health support integrated into digital platforms is also vital, given documented needs in populations navigating rapid change (Na et al., 2023). Furthermore, interdisciplinary research examining the nexus between digital education, sustainable resource management, and a future green economy is essential (Verschuur et al., 2024; Ye et al., 2023). Longitudinal studies tracking the implementation and impact of specific initiatives will be crucial for evidence-based policy refinement.

In conclusion, while digitalisation represents a pivotal strategic direction for modernisation and renewal in Libyan urban education, this analysis argues compellingly that the pathway is fraught with fundamentally non-technological challenges. The ultimate lesson is that the digital future will be built not only through technology, but through the less visible foundations of stable electricity, equitable access, effective governance, and culturally resonant pedagogy. Only by confronting these foundational issues with vigour equal to that applied to procuring technology can Libya ensure its digital education strategy becomes a genuine tool for empowerment and equitable development.

CONTRIBUTIONS

This analysis makes a distinct contribution by examining the intersection of digitalisation and education within the specific, under-researched context of post-conflict urban Libya. It provides a critical, evidence-based assessment of national strategies, such as the 2021-2026 digital transformation plan, against the realities of infrastructure and implementation in major cities. The study offers a framework for policymakers to identify and address the systemic barriers to equitable digital learning. Furthermore, it enriches comparative scholarly discourse on educational technology in fragile states by highlighting the unique socio-political dynamics that mediate digital adoption in the region.

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