

# Digital Classroom Management in Secondary Schools in Sierra Leone: Opportunities and Challenges

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## ABSTRACT

The global push for digital transformation in education has reached Sierra Leone's secondary schools, promising enhanced classroom management through technology. Yet beneath the policy rhetoric and donor-funded tablet distributions lies a complex reality that this study sought to understand. Using the Technology Acceptance Model (TAM) as its theoretical lens, this qualitative case study investigated digital classroom management practices across ten secondary schools in Sierra Leone, five urban and five rural. Through semi-structured interviews with 30 teachers and 10 principals, focus group discussions with students, classroom observations, and document analysis, the research uncovered a landscape marked by stark contradictions. Findings revealed that while digital tools have created unprecedented opportunities for student engagement through multimedia instruction and improved administrative efficiency through digital attendance tracking, these benefits remain deeply uneven. Infrastructure deficits, erratic electricity, and patchy connectivity continue to undermine even the most committed digital initiatives. More significantly, the study found that teachers' digital literacy levels and their perceptions of technology's usefulness (a core TAM construct) varied dramatically based on access to training and peer support. The research contributes empirically grounded insights to the limited scholarship on digital classroom management in post-conflict, resource-constrained contexts. Policy implications point toward the need for integration-focused strategies that address pedagogical support alongside infrastructure provision, suggesting that Sierra Leone's educational technology investments must prioritize teacher capacity building and context-appropriate solutions over hardware-centric approaches.

**Keywords:** digital classroom management, Technology Acceptance Model, secondary education, Sierra Leone, educational technology, Sub-Saharan Africa

## INTRODUCTION

### 1.1 Background of the Study

Walk into any classroom in 2024, whether in Freetown or Freetown's Californian counterpart, and you will likely encounter a scene that would have been unimaginable just two decades ago. Students stare intently at screens rather than at exercise books. Teachers project multimedia content rather than laboriously writing on chalkboards. Attendance is taken by tapping rather than by roll call. This is the reality of digital transformation in education, a global phenomenon that has fundamentally altered how teaching and learning occur. The integration of technology into education has accelerated dramatically since the turn of the millennium. Learning management systems like Google

Classroom, Moodle, and Canvas have become commonplace in schools across developed nations, enabling teachers to distribute assignments, provide feedback, and communicate with parents through digital platforms. Behaviour monitoring tools, once confined to paper-based merit and demerit systems, now offer real-time data analytics that track student engagement, participation patterns, and even emotional well-being. The COVID-19 pandemic served as an unprecedented catalyst, forcing educational systems worldwide to confront digital divides while simultaneously demonstrating technology's potential to maintain learning continuity during crises. Within this global context, the concept of classroom management has undergone significant evolution. Where traditional classroom management focused primarily on maintaining order, managing student behaviour, and organizing physical learning

**Relevant conflicts of interest/financial disclosures:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



spaces, digital classroom management encompasses a broader and more complex set of responsibilities. Teachers must now navigate online learning platforms, monitor student progress through digital dashboards, maintain digital records, communicate through multiple channels, and address cyberbullying and digital distraction all while continuing to manage the physical classroom environment. This dual responsibility demands new competencies, new pedagogical approaches, and new ways of thinking about the teacher's role. The growing importance of digital classroom management reflects broader shifts in educational philosophy. Contemporary approaches emphasize student-centered learning, personalized instruction, and data-informed decision-making, all of which digital tools can potentially facilitate. When implemented effectively, digital classroom management systems can free teachers from administrative tasks, provide richer information about student learning, and create more engaging, interactive learning environments. Yet these benefits remain contingent on numerous factors: adequate infrastructure, teacher competence, institutional support, and perhaps most fundamentally, teacher beliefs about technology's value and usability.

## **1.2 Context of Sierra Leone**

To understand digital classroom management in Sierra Leone, one must first appreciate the educational landscape from which it emerges. Sierra Leone's education system bears the scars of a brutal civil war (1991–2002) that destroyed schools, displaced teachers, and disrupted an entire generation's education. The post-conflict rebuilding effort has been nothing short of heroic, with communities rebuilding schools with meagre resources, teachers returning to classrooms despite meagre salaries, and international partners supporting reconstruction. Yet the legacy of conflict persists in damaged infrastructure, a compressed teacher workforce, and systemic fragility that makes educational innovation particularly challenging. Alongside this post-conflict context, Sierra Leone faces developmental challenges common to many Sub-Saharan African nations. The country ranks 181st out of 189 countries on the Human Development Index, with profound implications for educational resourcing. Electricity access remains limited; only 26% of the population has access to grid electricity,

with rural areas particularly underserved. Internet penetration, while growing, hovers around 18%, and connectivity, when available, is often slow, expensive, and unreliable. These infrastructure realities create a fundamental tension between the aspirational vision of digitally-enhanced education and the material conditions within which teachers and students operate. Despite these challenges, Sierra Leone has demonstrated a remarkable commitment to educational technology integration. The Ministry of Basic and Senior Secondary Education (MBSSE) has launched several initiatives to bring digital tools into classrooms. The Free Quality School Education program, introduced in 2018, included provisions for technology-enhanced learning. More recently, partnerships with organizations like UNICEF and EducAid have facilitated tablet distribution programs and teacher training in digital pedagogy. The government's National Innovation and Digital Strategy explicitly prioritizes education technology as a means of accelerating learning outcomes and preparing young Sierra Leoneans for a digital economy. Yet policy intentions and classroom realities often diverge. A teacher in rural Kailahun may receive a tablet through a donor program but lack electricity to charge it, internet connectivity to access online resources, or training to integrate it meaningfully into teaching. A principal in urban Freetown may celebrate the school's new computer laboratory while struggling to maintain aging equipment or find teachers competent to use it. These disjunctures between aspiration and implementation form the backdrop against which this study investigates digital classroom management practices.

## **1.3 Statement of the Problem**

Despite increasing advocacy for digital integration from government, development partners, and educational technology advocates, secondary schools in Sierra Leone face significant infrastructural, pedagogical, and policy barriers that affect effective digital classroom management. The problem is not simply that schools lack technology though many do but that even where technology exists, its potential remains largely unrealized. Tablets sit unused in locked cabinets. Computers lack maintenance and eventually cease functioning. Teachers receive devices without accompanying pedagogical training and revert to familiar chalk-and-talk methods.

Students encounter technology in isolated computer laboratory sessions disconnected from their regular classroom learning. This implementation gap reflects a broader challenge facing educational technology initiatives in developing contexts: the tendency to prioritize hardware provision over the complex ecosystem of factors that determine whether technology actually enhances teaching and learning. Infrastructure deficits are certainly part of the story, but so are teacher beliefs, institutional cultures, curriculum constraints, assessment practices, and policy frameworks that may inadvertently undermine digital integration. Understanding how these factors interact to shape digital classroom management practices requires empirical investigation grounded in the lived experiences of teachers, students, and school leaders. The problem is compounded by a striking research gap. While considerable scholarship exists on educational technology in developed countries, and a growing body of research addresses ICT in African education generally, very few studies have specifically examined digital classroom management at the secondary level in Sierra Leone. Policy decisions are consequently made on the basis of imported assumptions, donor priorities, or anecdotal evidence rather than locally-generated knowledge about what works, what doesn't, and why. This study seeks to address that gap by providing empirically grounded insights into the opportunities and challenges shaping digital classroom management in Sierra Leonean secondary schools.

#### 1.4 Purpose of the Study

The purpose of this qualitative case study is to investigate digital classroom management practices in secondary schools in Sierra Leone, examining both the opportunities these practices present and the challenges that hinder their effective implementation. Drawing on the Technology Acceptance Model as a theoretical framework, the study aims to understand how teachers' perceptions of technology's usefulness and ease of use interact with infrastructural, pedagogical, and policy factors to shape digital classroom management outcomes. By examining practices across ten diverse schools, the research seeks to generate insights that can inform more effective policy, better-targeted teacher professional development, and more contextually appropriate technology integration strategies.

#### 1.5 Research Questions

This study is guided by four research questions:

1. What digital classroom management practices are currently used in secondary schools in Sierra Leone?
2. What opportunities do these practices present for enhancing teaching, learning, and school administration?
3. What challenges hinder effective implementation of digital classroom management in these schools?
4. How can digital classroom management be strengthened in the Sierra Leonean context?

#### 1.6 Significance of the Study

This research is significant for multiple stakeholders, including policymakers at the MBSSE and other government agencies. The study provides evidence-based insights to inform national ICT in education strategies, teacher training policies, and infrastructure investment decisions. Rather than relying on generalized assumptions about technology's benefits, policymakers can draw on context-specific knowledge about what actually enables or constrains digital classroom management in Sierra Leonean conditions.

**For school leaders:** the findings offer practical guidance on supporting teachers' digital integration efforts, creating enabling conditions for technology use, and navigating the challenges that arise when digital tools enter classrooms. Principals and head teachers confronting the day-to-day realities of managing technology-enhanced schools will find insights grounded in experiences similar to their own. Teacher training institutions stand to benefit from the study's illumination of the competencies teachers actually need for effective digital classroom management. Pre-service and in-service programs can be refined to address the gaps identified by this research, ensuring that teacher preparation aligns more closely with classroom realities.

**For ICT planners and development partners:** the research highlights the complex interplay of factors that determine technology's educational impact. Hardware provision alone, the findings suggest, is insufficient; successful digital integration requires simultaneous attention to infrastructure, training,

support, and pedagogical alignment. The study offers evidence to guide more holistic, sustainable intervention designs. Finally, the research contributes to academic scholarship by extending the application of the Technology Acceptance Model to a novel context, secondary education in post-conflict Sierra Leone and by generating empirical knowledge about digital classroom management in a setting where such research remains scarce. The findings add to the growing body of literature on educational technology in Sub-Saharan Africa while offering insights transferable to other resource-constrained contexts.

## LITERATURE REVIEW

### 2.1 Conceptualizing Digital Classroom Management

To understand digital classroom management, we must first consider what classroom management entails in its traditional sense. Evertson and Weinstein (2006) define classroom management as "the actions teachers take to create an environment that supports and facilitates both academic and social-emotional learning" (p. 4). This encompasses establishing routines, managing student behaviour, organizing physical space, developing caring relationships, and implementing engaging instruction. Traditional classroom management, in this framing, is fundamentally about creating conditions conducive to learning. Digital classroom management extends this concept into technology-enhanced environments. It refers to the practices teachers employ to manage learning when digital tools are integral to instruction, whether in fully online, blended, or technology-supplemented classrooms. These practices include monitoring student engagement with digital content, managing online discussions, maintaining digital records of attendance and achievement, communicating with students and parents through digital channels, and addressing technology-specific behavioural issues such as cyberbullying and off-task device use (Kearney et al., 2020). The emergence of technology-enhanced learning environments has fundamentally altered several dimensions of classroom management.

**Consider discipline:** where traditional approaches relied on direct teacher observation of behaviour, digital environments may require monitoring online

interactions, managing device use during lessons, and addressing misbehaviour that occurs beyond the physical classroom. Monitoring becomes simultaneously more granular as teachers can track exactly which students have accessed which resources and more challenging, as students may be digitally engaged while mentally disengaged. Communication expands from face-to-face interactions and parent-teacher conferences to encompass emails, messaging apps, learning management system announcements, and digital newsletters.

**Assessment:** transforms from paper-based tests and assignments to online quizzes, digitally-submitted work, and automatically-generated performance data. These shifts demand new teacher competencies. Teachers must develop technical skills to operate digital tools, pedagogical skills to integrate them meaningfully, and managerial skills to orchestrate learning across physical and digital spaces. The teacher's role evolves from sole authority and knowledge dispenser to facilitator, orchestrator, and co-learner in digitally-mediated environments (Ertmer & Ottenbreit-Leftwich, 2010). This transformation is neither automatic nor easy; it requires significant shifts in teachers' identities, beliefs, and practices.

### 2.2 Theoretical Framework: Technology Acceptance Model (TAM)

The theoretical frameworks are not merely decorative; they provide the analytical lens through which research questions are formulated, data interpreted, and conclusions drawn. This study employs the Technology Acceptance Model (TAM), originally developed by Fred Davis in 1989, as its guiding theoretical framework. TAM's enduring relevance and extensive empirical validation make it particularly suitable for investigating technology adoption in educational contexts.

TAM posits that two primary beliefs determine an individual's intention to use technology:

perceived usefulness and perceived ease of use. Perceived usefulness refers to the degree to which a person believes that using a particular technology would enhance their job performance in this context, whether teachers believe digital tools will help them



manage classrooms more effectively. Perceived ease of use concerns whether the person believes using the technology would be free of effort, essentially, whether teachers find digital tools accessible and manageable within their existing competencies and conditions (Davis, 1989). These two beliefs influence attitudes toward technology, which in turn shape behavioural intentions and ultimately actual technology use. Importantly, TAM also recognizes that external variables, such as system design characteristics, training, organizational support, and, in this study's context, infrastructure conditions, influence these core beliefs. The model thus provides a framework for understanding not just whether teachers accept technology, but why: which factors enhance their perceptions of usefulness and ease, and which undermine them. Why is TAM particularly appropriate for Sierra Leone's context? Several reasons justify this choice. First, TAM's focus on perceived usefulness resonates with the practical orientation of Sierra Leonean teachers who must weigh technology's benefits against significant implementation challenges. A teacher in a school with unreliable electricity will only persist with digital tools if they perceive genuine value exceeding the effort required. Second, TAM's attention to ease of use acknowledges the reality that many Sierra Leonean teachers have limited prior exposure to educational technology; their willingness to adopt digital practices depends critically on whether these practices feel accessible given their current digital literacy levels. Third, TAM's recognition of external variables allows the framework to accommodate the infrastructural, institutional, and policy factors that shape technology adoption in resource-constrained settings. The framework guides this study's analysis in several ways. It focuses attention on teachers' perceptions as crucial mediators between technology provision and actual classroom practice. It suggests that successful digital classroom management requires attention to both usefulness (demonstrating clear benefits) and ease (providing accessible tools and adequate support). It provides a lens for understanding variation in adoption patterns across schools and individual teachers. And it offers explanatory purchase on why hardware provision alone so often fails to translate into meaningful classroom integration a phenomenon that TAM would

predict when teachers do not perceive the technology as sufficiently useful or easy to use.

### **2.3 Global Perspectives on Digital Classroom Management**

Internationally, digital classroom management has evolved rapidly alongside technological advancement. Learning Management Systems (LMS) like Google Classroom, Canvas, and Schoology have become standard tools in many educational systems, offering integrated platforms for content delivery, assignment submission, grading, and communication. Research from North America and Europe suggests that effective LMS implementation can enhance teacher efficiency, improve student organization, and facilitate more timely feedback (Broadbent, 2017). However, studies also note that LMS adoption often remains superficial, with teachers using basic features while neglecting more transformative functionalities. Digital behaviour monitoring tools represent another significant development. Systems like ClassDojo, GoGuardian, and LanSchool allow teachers to monitor student device activity, track on-task behaviour, and generate behavioural data. Proponents argue these tools enable more targeted interventions and positive behaviour reinforcement (Williamson, 2017). Critics raise concerns about surveillance, student privacy, and the potential for data to be used punitively rather than supportively. These debates highlight tensions inherent in digital classroom management between enhanced monitoring capabilities and ethical considerations about student autonomy and data rights. More recently, AI-supported classroom analytics have entered educational discourse, promising real-time insights into student engagement, learning progress, and even emotional states. While these technologies remain emergent and concentrated in well-resourced contexts, they foreshadow future directions in digital classroom management. Research cautions, however, that algorithmic approaches may perpetuate biases, reduce teaching to measurable indicators, and undermine professional teacher judgement (Selwyn, 2019). Critically reviewing this global literature reveals both successes and limitations. Successes include documented improvements in administrative efficiency, student engagement, and data-informed instruction in contexts with well-supported implementation. Criticisms point to the risk of

technology driving pedagogy rather than serving it, the exacerbation of inequalities when digital divides exist, and the tendency to adopt technological solutions without adequate consideration of local contexts and needs. These critiques are particularly salient when considering technology transfer to developing contexts like Sierra Leone.

#### **2.4 Digital Education in Sub-Saharan Africa**

The Sub-Saharan African context introduces distinctive dimensions to digital classroom management that global literature often overlooks. Research across the region consistently identifies fundamental infrastructural challenges: electricity instability that prevents reliable device use, connectivity gaps that limit access to online resources, and urban-rural inequality that concentrates infrastructure in capital cities and regional centres (Hennessy et al., 2022). These conditions mean that digital classroom management in African schools often involves intermittent, unreliable access to technology, a reality fundamentally different from the always-on connectivity assumed in much global research. Teacher digital competency emerges as another critical theme. Studies across multiple African countries reveal that while teachers may possess basic digital skills, they often lack pedagogical digital competence, the ability to integrate technology meaningfully into teaching and learning (Agyei & Voogt, 2011). Training programs, where they exist, frequently emphasise technical skills over pedagogical integration, leaving teachers with devices and software but a limited understanding of how to use them for educational purposes. This disconnect between access and effective use reflects broader patterns in technology transfer. Policy analysis adds another layer of critique. Many African ICT in education policies emphasise providing access to devices, building computer laboratories, expanding connectivity, and making the necessary pedagogical, curricular, and assessment changes to enable technology to enhance learning (Kozma & Vota, 2014). The assumption appears to be that access automatically generates integration, an assumption that decades of research contradict. Teacher professional development, curriculum reform, and assessment alignment receive less policy attention, creating situations where technology exists in schools but remains peripheral to actual teaching and learning.

#### **2.5 ICT Integration in Sierra Leone**

Within this regional context, Sierra Leone presents a distinctive case shaped by its post-conflict trajectory and current development challenges. Government ICT policy in education, articulated through documents such as the National ICT Policy (2018) and various MBSSE strategic plans, sets ambitious goals for technology integration. These policies envision digitally-literate graduates, technology-enhanced teaching, and the use of ICT to expand educational access and quality. However, implementation remains constrained by limited resources, weak institutional capacity, and competing priorities within an education system still addressing basic access and quality challenges. Research on teacher preparedness for ICT integration in Sierra Leone reveals significant gaps. Studies by Bangura (2020) and Kamara (2021) indicate that while many teachers recognize technology's potential, their actual competence and confidence remain low. Pre-service teacher education programs have only recently begun incorporating ICT training, and in-service opportunities remain limited and unevenly distributed. Teachers in urban areas with greater technology exposure tend to be more confident, while their rural counterparts, who arguably need technology most to overcome isolation, often have least access to both technology and training. Infrastructure realities sharply constrain what is possible. The electricity access figures cited earlier translate into concrete classroom challenges: devices that cannot be charged, computer laboratories that remain dark, projectors that sit unused. Connectivity gaps mean that even when devices function, access to online resources, cloud-based tools, and digital communication platforms is limited. These material constraints intersect with teacher capacity issues, creating situations where well-intentioned digital initiatives founder on basic infrastructure failures. Donor-driven initiatives have significantly shaped Sierra Leone's educational technology landscape. Organizations such as UNICEF, EducAid, the World Bank, and various NGOs have funded device provision, teacher training, and digital content development. These initiatives have brought resources and expertise that the government alone could not provide. However, they also raise questions about sustainability, alignment with national

priorities, and the long-term viability of projects that depend on external funding. When donor projects end, schools are often left with equipment they cannot maintain and practices they cannot sustain. The research gap that this study addresses becomes evident when reviewing existing literature. While policy documents articulate visions, and while implementation challenges are acknowledged anecdotally, limited empirical research exists on digital classroom management at the secondary level in Sierra Leone. Studies have examined ICT access, teacher attitudes, and policy frameworks, but none have specifically investigated the practices of digital classroom management, how teachers actually use technology to manage learning, the opportunities these practices create, and the challenges that constrain them. This study aims to fill that gap through systematic empirical investigation grounded in teachers' lived experiences.

## METHODOLOGY

### 3.1 Research Design

This study employed a qualitative case study design, a methodological choice justified by several considerations. First, the research sought to understand digital classroom management practices in depth and to contextualize the "how" and "why" questions that qualitative approaches are particularly suited to address (Yin, 2018). Quantitative methods could measure technology access or survey teacher attitudes, but only qualitative investigation could illuminate the complex, situated practices through which teachers actually manage digital classrooms. Second, the case study approach allowed for multiple sources of evidence, interviews, observations, and documents, enabling triangulation and rich description. By examining practices across multiple schools, the study could identify both patterns and variations while maintaining attention to each school's unique context. The design was instrumental in that the cases were selected to provide insight into the broader phenomenon of digital classroom management, rather than being studied for their intrinsic interest alone. Third, the qualitative case study design aligned with the study's theoretical framework. TAM's emphasis on perceptions and beliefs, internal states not directly observable, required methods capable of exploring teachers'

subjective understandings. Interviews and focus groups could probe how teachers perceived usefulness and ease of use, what shaped those perceptions, and how they influenced classroom practices.

### 3.2 Population and Sampling

The study was conducted across ten secondary schools in Sierra Leone, purposively selected to ensure diversity of experience and context. Five schools were located in urban areas (greater Freetown and Bo) where infrastructure and technology access are relatively better. Five were rural schools (in Kailahun, Pujehun, and Bombali districts) where connectivity, electricity, and resource access present greater challenges. This urban-rural stratification was essential for capturing the range of conditions under which digital classroom management occurs. Within each school, participants were purposively selected to include those with direct experience of digital classroom management. The sample comprised:

30 teachers (3 per school), selected to represent variation in subjects taught, years of experience, and levels of technology engagement

10 principals (1 per school), providing institutional perspectives on digital policies, challenges, and support

10 focus groups with students (1 per school, 6-8 students each), offering learner perspectives on digital classroom practices

This sampling strategy ensured multiple perspectives on each school's digital classroom management while maintaining focus on teachers as the primary actors in implementing digital practices.

### 3.3 Data Collection Methods

Data collection employed multiple methods to capture the richness of digital classroom management practices. Semi-structured interviews with teachers and principals explored participants' experiences with digital tools, their perceptions of usefulness and ease of use, the practices they had developed, the challenges they encountered, and their suggestions for improvement. Interviews lasted 45-75 minutes and were conducted in settings chosen by participants

typically classrooms or staff rooms. Focus group discussions with students provided complementary perspectives. Students were asked about their experiences with digitally-managed classrooms, what they saw as benefits and drawbacks, how teachers used technology, and what they wished were different. These discussions, lasting 30-45 minutes, were conducted in accessible locations within each school. Classroom observations, (2-3 per school) allowed direct witnessing of digital classroom management practices in action. Observations focused on how teachers integrated technology into lessons, how they managed both physical and digital learning environments, how students responded, and what challenges emerged during actual practice. Field notes documented both practices and the contexts within which they occurred. Document review, supplemented these primary data sources. School ICT policies, lesson plans, attendance records, and any available digital communication with parents were examined to understand the formal and informal frameworks shaping digital classroom management.

### 3.4 Data Analysis

Data analysis employed thematic analysis following the six-phase framework outlined by Braun and Clarke (2021). This systematic approach ensured rigorous engagement with the data while allowing themes to emerge inductively while remaining attentive to the theoretical framework.

#### Phase one involved:

familiarization through repeated reading of transcripts and field notes, listening to audio recordings, and initial noting of ideas.

#### Phase two generated:

initial codes across the entire dataset, capturing interesting features relevant to the research questions.

#### Phase three involved

searching for themes, collating codes into potential themes that captured something significant about digital classroom management opportunities and challenges.

#### Phase four

reviewed themes against coded extracts and the entire dataset, refining theme boundaries and checking for internal consistency. Phase five defined and named themes, developing detailed analyses of each. Phase six produced the written report, selecting vivid extracts and relating analysis back to research questions and literature. Throughout analysis, attention remained on both manifest content (what participants explicitly stated) and latent content (underlying assumptions, beliefs, and meanings). The theoretical framework sensitized analysis to perceptions of usefulness and ease, while remaining open to unexpected findings.

### 3.5 Ethical Considerations

Ethical considerations were paramount throughout this research. Informed consent was obtained from all participants after full disclosure of the study's purpose, procedures, potential risks, and benefits. Particular care was taken with student participants, ensuring they understood their participation was voluntary and that they could withdraw at any time without consequence. Parental consent was obtained for all student participants.

**Anonymity**, was guaranteed through use of pseudonyms and removal of identifying details from all data. Schools are referred to by region only (urban/rural), and individual participants are identified by role and number rather than name. Data storage followed strict protocols, with all materials password-protected and accessible only to the research team.

**Institutional approval** was obtained from the relevant ethics review board and from Sierra Leone's Ministry of Basic and Senior Secondary Education, which granted permission to conduct research in schools. Individual school principals provided additional site-level approval.

**Reciprocity** considerations guided the research process. While participants were not compensated, the research team offered to share findings with schools and to provide brief training sessions where requested. This ensured that schools gained some immediate benefit from their participation.

## 4. Findings



The findings are organized into two main sections corresponding to the study's focus on opportunities and challenges. Within each section, themes emerged from systematic analysis of interview transcripts, observation notes, focus group discussions, and documents.

## **4.1 Opportunities of Digital Classroom Management**

### **4.1.1 Improved Student Engagement**

Across schools, teachers consistently reported that digital tools enhanced student engagement, particularly when used for multimedia instruction. A teacher at an urban school explained:

When I used to teach with just chalk and talk, half the students would be daydreaming by the end of the first ten minutes. Now I can show videos, project images, play audio clips. They sit up. They pay attention. Even the ones who normally struggle, they're watching, they're listening. (Teacher 4, Urban School)

Observations confirmed this pattern. In classrooms where teachers effectively integrated digital content, students displayed greater attention, participated more actively in discussions, and asked more questions. The visual and interactive nature of digital resources appeared particularly beneficial for students with varied learning preferences and for making abstract concepts more concrete. Students themselves affirmed this perspective. Focus group participants described digital lessons as "more interesting" and "easier to understand" than traditional instruction. Several noted that they remembered content better when it was presented through video or interactive activities. However, students also distinguished between meaningful digital integration and superficial use, criticizing teachers who simply projected text without explanation or used technology as a babysitter rather than a teaching tool.

### **4.1.2 Better Monitoring and Accountability**

Digital tools had transformed how teachers track attendance, monitor student work, and document achievement. Digital attendance systems, where available, provided more accurate records and freed instructional time previously consumed by roll calls. A principal observed:

Before, teachers would spend the first ten minutes of every lesson calling names. Now they take attendance on their tablets in two minutes. That's ten minutes per lesson times maybe six lessons per day—an hour of instructional time saved. That adds up. (Principal 2, Urban School)

Assignment tracking through platforms like Google Classroom enabled teachers to monitor submission patterns, identify students falling behind, and provide more timely feedback. Several teachers described using digital records to inform parent conversations, replacing vague generalizations with specific data about attendance patterns, assignment completion, and performance trends. The accountability dimension extended to teachers themselves. Digital record-keeping created transparent documentation of teaching activities that some principals found valuable for supervision. However, this also generated some teacher resistance, discussed later among challenges.

### **4.1.3 Administrative Efficiency**

Beyond classroom-specific benefits, digital tools enhanced overall school administration. Record-keeping that once required manual entries in multiple ledgers could now be accomplished digitally, with automatic backups and easier retrieval. Communication with parents improved through messaging apps and digital newsletters, particularly in urban areas where parents were more likely to own smartphones.

One school had developed an innovative system using basic mobile phones for parent communication:

We can't afford fancy systems, but we use WhatsApp groups for each class. Teachers post updates, homework reminders, attendance alerts. Parents appreciate it, and it's helped us catch problems earlier when a student is missing school, we can alert the parent immediately instead of waiting for the monthly report. (Teacher 12, Urban School)

This example illustrates how digital tools, even relatively simple ones, could enhance school-family connections when creatively adapted to local conditions.

### **4.1.4 Teacher Professional Growth**

Engagement with digital tools had stimulated professional learning among many teachers. Those

who embraced technology reported expanded access to teaching resources, online professional development, and connections with other educators through social media and professional networks. A teacher in a rural school described:

Before I got the tablet, I was teaching the same lessons I learned in training college fifteen years ago. Now I can search for new ideas, download lesson plans, watch how teachers in other countries teach the same topics. It's like someone opened a window. (Teacher 21, Rural School) This professional growth dimension extended beyond formal training. Teachers learned from each other, sharing tips and troubleshooting problems collaboratively. Schools where teachers supported each other's digital learning reported higher adoption rates and more innovative practices than those where teachers worked in isolation.

## **4.2 Challenges of Digital Classroom Management**

### **4.2.1 Infrastructural Barriers**

Despite the opportunities identified, infrastructural challenges fundamentally constrained digital classroom management across most schools. Electricity instability emerged as the most pervasive barrier, affecting urban and rural schools alike, though more severely in rural areas. You plan a lesson using the projector, you've got the video ready, the students are excited. Then the power cuts. Just like that, your lesson plan is ruined. You scramble for a backup, but you're teaching with chalk again, and the students are disappointed. (Teacher 8, Urban School) Schools attempted various adaptations charging devices at home, using generators, staggering technology use to conserve battery but these workarounds added complexity and uncertainty to teaching. Teachers described constantly calculating: would the power last through this lesson? Could they risk depending on technology today? Internet connectivity gaps compounded electricity challenges. Even when devices were charged and functional, access to online resources remained unreliable. Downloading content in advance helped, but this required foresight and additional time. Interactive features of digital tools online quizzes, collaborative documents, real-time communication remained largely inaccessible in schools without consistent connectivity. The urban-rural divide was stark. While urban schools

experienced intermittent disruptions, rural schools often operated for days or weeks without any electricity or connectivity. Digital classroom management in these contexts meant using devices in bursts when conditions permitted, then reverting to traditional methods. This discontinuity prevented the development of consistent practices and limited teachers' willingness to invest effort in digital approaches.

### **4.2.2 Limited Digital Literacy**

Infrastructure challenges, while severe, were compounded by human capacity limitations. Teachers' digital literacy varied enormously, from those who confidently integrated multiple tools to those who struggled with basic operations. A principal described the spectrum:

Some of our teachers are amazing they're using the tablets, finding resources, creating content. Others can barely turn the thing on. The middle group knows how to do basic things but gets stuck when something goes wrong. And something always goes wrong eventually. (Principal 5, Urban School) Observations confirmed this variation. Confident teachers navigated smoothly between applications, maintained student engagement, and recovered gracefully when technology failed. Less confident teachers became visibly anxious when using digital tools, their uncertainty communicating itself to students and disrupting lesson flow. Some avoided technology altogether, returning to methods they felt they could control. Students' digital literacy presented another challenge. While many students were familiar with mobile phones and social media, this informal digital literacy did not automatically translate to academic technology use. Students needed guidance on using digital tools for learning rather than entertainment, on appropriate online behaviour, and on navigating educational platforms. Teachers who were themselves developing digital competence struggled to provide this guidance.

### **4.2.3 Financial Constraints**

The financial realities of Sierra Leonean schools and families created persistent barriers. Device provision, often through donor programs, addressed initial access but not ongoing costs. When tablets broke,

schools lacked funds to repair them. When software required updates, licenses could not be purchased. When devices were stolen, which was not uncommon, they could not be replaced.

Teachers sometimes bear personal costs for digital classroom management:

I use my personal phone and data to take digital attendance and communicate with parents. The school can't provide these things. So, I'm spending my own money to do my job. I don't mind, but it adds up. (Teacher 16, Urban School) This pattern of teachers subsidizing school technology through personal resources was widespread but unsustainable, particularly for teachers with limited means. Students faced similar pressures. While some families could afford smartphones or tablets for their children, many could not. Digital homework created inequities when some students had access to technology at home while others did not. Teachers navigated this by making digital activities optional or by ensuring school time for technology-dependent tasks, but these adaptations limited the extent of digital integration possible.

#### 4.2.4 Policy and Leadership Gaps

School-level policies for digital classroom management were often absent or inconsistently applied. Few schools had clear guidelines on appropriate technology use, data protection, or digital behaviour expectations. This ambiguity left teachers uncertain about boundaries and exposed schools to risks. Nobody has told us what we should or shouldn't do with student data. We're just using these tools, keeping these records, and hoping we're doing the right thing. What happens if there's a problem? Who's responsible? (Teacher 9, Urban School) Leadership support varied dramatically. Principals who modelled digital use, provided encouragement, and solved problems enabled stronger teacher adoption. Principals who were themselves uncomfortable with technology or saw digital initiatives as donor projects rather than core educational priorities did little to support teachers' efforts. At the policy level, the absence of clear national guidance on digital classroom management left schools to improvise. While the MBSSE had articulated general ICT goals in education, specific guidance on classroom-level digital practices remained limited. Schools lacked

frameworks for teacher development, technology procurement, or digital resource selection.

#### 4.2.5 Resistance to Change

Not all teachers embraced digital classroom management. Resistance took various forms: active opposition, passive non-use, and surface compliance without meaningful integration. Underlying this resistance were complex factors, including fear of technology, skepticism about its educational value, and concern about increased workload. I've been teaching for twenty-five years without all this technology. My students have passed exams, gone to university, and become successful people. Why do I need to change now? This is just extra work that doesn't make me a better teacher. (Teacher 28, Rural School) This teacher's perspective, while not universal, reflected genuine concerns. For experienced teachers with established practices, digital tools could feel like an imposition rather than an enhancement. The effort required to learn new skills, adapt lessons, and manage technology-related problems seemed disproportionate to perceived benefits, precisely the calculation TAM would predict. Younger teachers were generally more receptive, though not uniformly so. Some early-career teachers expressed frustration that digital tools they had learned about in training were unavailable or unusable in their schools. The gap between aspirational training and actual conditions generated its own form of resistance disillusionment rather than opposition, but equally limiting to effective practice.

### DISCUSSION

This study's findings illuminate the complex landscape of digital classroom management in Sierra Leonean secondary schools, revealing both the promise of technology-enhanced education and the profound challenges that constrain its realization. Discussing these findings through the lens of the Technology Acceptance Model and in relation to existing literature illuminates their theoretical and practical significance.

#### 5.1 Perceived Usefulness: The Conditional Promise of Digital Tools

TAM's core construct of perceived usefulness whether teachers believe technology enhances their performance emerged strongly from the data. Teachers who had experienced successful digital integration described multiple benefits: improved student engagement, more efficient administration, better monitoring capabilities, and expanded access to professional resources. These teachers perceived digital tools as genuinely useful, and their adoption practices reflected that belief. However, the data also revealed that perceived usefulness is not inherent in technology but emerges from experience and from conditions that enable positive experiences. Teachers whose digital attempts were thwarted by power cuts, connectivity failures, or technical problems developed very different perceptions. For them, technology was not useful but unreliable, not enhancing but complicating. Their resistance, from a TAM perspective, is entirely rational: why invest effort in tools that consistently fail to deliver? This finding extends TAM by highlighting how external variables in resource-constrained contexts can fundamentally shape perceived usefulness. Davis's original model acknowledged external variables but did not specify them. This study demonstrates that in Sierra Leone, infrastructural conditions are not merely background factors but active shapers of teachers' usefulness perceptions. When electricity is unstable and connectivity unreliable, even well-designed tools may be perceived as useless because they cannot be depended upon. The urban-rural differences in perceived usefulness are particularly instructive. Urban teachers, despite their own challenges, experienced sufficient reliability to develop positive usefulness perceptions. Rural teachers, facing more severe constraints, were less likely to have the consistent positive experiences that build perceived usefulness. This suggests that improving perceived usefulness requires not just demonstrating technology's potential but ensuring the conditions for its reliable realization.

## 5.2 Perceived Ease of Use: The Competence Gap

TAM's second core construct perceived ease of use proved equally significant. Teachers' willingness to adopt digital practices depended critically on whether they found tools accessible and manageable. The wide variation in digital literacy across the teacher workforce meant that ease of use was experienced

very differently. For digitally confident teachers, tools were easy enough to use; for those with limited skills, even basic operations felt overwhelming. This finding aligns with existing Sub-Saharan African research on teacher digital competency (Agyei & Voogt, 2011; Hennessy et al., 2022) but adds nuance by showing how perceived ease interacts with other factors. Teachers who received adequate training and ongoing support developed greater confidence and perceived tools as easier to use. Those left to learn on their own, or who experienced training disconnected from classroom realities, struggled with ease perceptions regardless of their initial attitudes. The finding also illuminates a dynamic that TAM alone might not fully capture: perceived ease changes over time with experience. Several teachers described initial struggles that gave way to competence through persistence and peer support. This suggests that ease perceptions are malleable and that interventions to support teachers through initial difficulty could shift their technology acceptance trajectories. However, the data also reveal limits to this malleability. When tools are genuinely difficult to use—poorly designed, unreliable, or mismatched to teacher needs increased experience may only reinforce negative ease perceptions. Several teachers described giving up on particular tools after repeated failures, their perceptions of difficulty confirmed rather than overcome by experience. This highlights the importance of tool design and contextual appropriateness alongside teacher training.

## 5.3 The External Variables: Infrastructure, Policy, and Support

TAM's recognition that external variables influence core beliefs proved essential for interpreting this study's findings. Infrastructure, policy, leadership, and support conditions fundamentally shaped both the possibilities for digital classroom management and teachers' perceptions of those possibilities.

### Infrastructure

emerged as perhaps the most fundamental external variable. Without reliable electricity and connectivity, no amount of teacher training or positive attitude could produce effective digital classroom management. This finding echoes research across Sub-Saharan Africa (Kozma & Vota, 2014) while adding



specificity about how infrastructure failures cascade through teachers' decision-making. Teachers made constant calculations about technology use based on infrastructure conditions: whether to risk the projector in this lesson, whether to plan for connectivity that might not exist, whether to invest effort in digital resources that might be inaccessible.

### **Policy and leadership**

shaped the institutional environment within which digital classroom management occurred. Schools with clear policies, supportive principals, and collaborative cultures enabled teacher adoption. Schools lacking these conditions left teachers to navigate challenges individually, with predictably uneven results. This finding aligns with organizational research on technology implementation (Ertmer & Ottenbreit-Leftwich, 2010) while highlighting specific leadership practices relevant to Sierra Leonean contexts.

### **Support systems**

technical support when things break, pedagogical support when teachers struggle, peer support for shared learning emerged as crucial enablers. Where support existed, teachers persisted through difficulties and developed more sophisticated practices. Where support was absent, even motivated teachers eventually gave up or limited their technology use to basic functions. This finding has significant implications for intervention design, suggesting that support is not an add-on to technology provision but a core requirement for meaningful adoption.

### **5.4 Opportunities and Challenges: The Dual Reality**

The study's findings on opportunities and challenges reveal not separate lists but an interconnected reality where each opportunity carries corresponding challenges. Improved student engagement through multimedia instruction, for example, depends on electricity to power devices and teachers skilled in selecting and integrating digital content. Better monitoring through digital attendance requires functional devices and teachers willing to use them consistently. Administrative efficiency presupposes infrastructure stability that currently does not exist in

many schools. This interconnectedness has important implications for intervention design. Isolated solutions providing devices without addressing electricity, training teachers without ensuring connectivity will likely fail because they address only part of the ecosystem within which digital classroom management must function. Effective strategies must address the multiple, interacting factors that shape technology's educational impact. The findings also reveal that opportunities and challenges are distributed unevenly across schools and teachers. Urban schools with better infrastructure and more digitally confident teachers experience more opportunities and fewer challenges than their rural counterparts. This raises equity concerns: if digital classroom management advantages are concentrated in already-advantaged schools, technology could widen rather than narrow educational inequalities. Policy attention to equity ensuring rural and disadvantaged schools receive adequate support is essential.

### **5.5 Connecting to Broader Literature**

These findings both align with and extend existing scholarship. The identification of infrastructure, teacher capacity, and policy support as critical factors echoes research across developing contexts (Hennessy et al., 2022). The application of TAM provides theoretical coherence while demonstrating the model's utility in resource-constrained settings where it has been less frequently applied. The study extends existing literature by providing empirically-grounded insights specifically about digital classroom management rather than general ICT integration. While much research examines technology access or teacher attitudes, this study focuses on the practices through which teachers actually manage digital learning environments. This practice focus reveals dynamics the constant infrastructure calculations, the peer learning networks, the adaptation strategies that broader studies might miss. The findings also contribute to critiques of technology-centric educational interventions. The pattern identified in policy analysis emphasis on access over pedagogical integration (Kozma & Vota, 2014) was evident in Sierra Leone, where device provision had outpaced teacher development and infrastructure support. This study's evidence reinforces calls for more holistic,

ecosystem-aware approaches to educational technology.

## RECOMMENDATIONS

Based on these findings, recommendations are organized by stakeholder group and formulated to be Specific, Measurable, Achievable, Realistic, and Time-bound (SMART).

### 6.1 Government Level (MBSSE and Related Agencies)

**Recommendation 1:** Develop a National Digital Classroom Management Framework

Within 18 months, the MBSSE should develop and disseminate a comprehensive framework providing guidance on digital classroom management practices, data protection, acceptable use policies, and teacher competency expectations. This framework should be developed through consultation with teachers, school leaders, and technology experts, and should include practical implementation guidance appropriate to Sierra Leonean conditions.

**Recommendation 2:** Integrate Digital Pedagogy into Pre-service Teacher Education

By the 2025 academic year, all teacher training institutions should incorporate mandatory digital pedagogy courses into their curricula. These courses should address not just technical skills but pedagogical integration, classroom management in technology-enhanced environments, and adaptation to resource-constrained conditions. The MBSSE should monitor implementation through its quality assurance mechanisms.

**Recommendation 3:** Address Infrastructure Gaps Through Phased Investment

Over a five-year period, government should implement a phased infrastructure investment plan prioritizing: (a) solar-powered charging solutions for off-grid schools, (b) expansion of school connectivity through appropriate technologies (considering both grid and off-grid solutions), and (c) device maintenance systems to ensure sustainability beyond initial provision.

## 6.2 School Leadership

**Recommendation 4:** Develop School-Level Digital Policies

Within 12 months, each secondary school should develop a contextualized digital classroom management policy addressing acceptable use, data protection, digital behaviour expectations, and teacher support mechanisms. These policies should be developed collaboratively with teachers, students, and parents to ensure ownership and practical relevance.

**Recommendation 5:** Establish Peer Learning Structures

Schools should establish formal peer learning structures professional learning communities, teacher working groups, or mentoring systems focused on digital classroom management. These structures should meet regularly, share effective practices, troubleshoot problems collectively, and document learning. Principals should allocate time within school schedules for these activities.

**Recommendation 6:** Model Digital Leadership

School principals should actively model digital tool use, participate in professional development alongside teachers, and visibly support digital classroom management initiatives. This leadership modelling should extend to problem-solving principals should engage with infrastructure and support challenges rather than leaving teachers to navigate them alone.

## 6.3 Teacher Training Institutions

**Recommendation 7:** Develop Context-Relevant Training Materials

Teacher training institutions should collaborate with schools to develop training materials and case studies grounded in Sierra Leonean classroom realities. These materials should address both opportunities and challenges of digital classroom management, preparing teachers for conditions they will actually encounter rather than idealized technology-rich environments.

**Recommendation 8:** Establish School-Based Practicum Experiences Pre-service teacher education should include structured practicum experiences in schools implementing digital classroom management. These experiences should include observation, supervised practice, and reflection, enabling student teachers to learn from practicing teachers while receiving university support.

**Recommendation 9:** Create Continuous Professional Development Pathways

Institutions should develop modular, flexible professional development opportunities for practicing teachers, recognizing that one-time training is insufficient. These pathways should include face-to-face workshops, online learning options (where connectivity permits), and school-based support. Certification or recognition should incentivize teacher participation.

#### 6.4 Development Partners

**Recommendation 10:** Shift from Device-Centric to Ecosystem Approaches

Development partners should reorient interventions from hardware provision toward comprehensive ecosystem support, addressing infrastructure, teacher development, content creation, and sustainability. New programs should conduct thorough contextual analysis before design and should include explicit sustainability and exit strategies.

**Recommendation 11:** Support Research and Knowledge Generation

Partners should fund and facilitate ongoing research on digital classroom management in Sierra Leone to build the evidence base for policy and practice. This research should be collaborative, involving Sierra Leonean researchers and institutions, and should generate locally-relevant knowledge rather than extracting data for external consumption.

#### Foster Cross-Sector Collaboration

**Recommendation 12:**

Partners should facilitate collaboration between the education, energy, and telecommunications sectors to

address infrastructure challenges holistically. Educational technology initiatives should coordinate with electricity access programs, connectivity expansion projects, and private sector partners to create conditions for sustainable digital integration.

#### CONCLUSION

This study set out to investigate digital classroom management in secondary schools in Sierra Leone, examining both the opportunities these practices present and the challenges that constrain their effective implementation. Through qualitative case study research across 10 diverse schools, the study has generated empirically grounded insights into how teachers navigate the complex terrain of technology-enhanced education in a resource-constrained, post-conflict context. The findings reveal a landscape of profound contradiction. Digital tools have genuinely transformed aspects of classroom management, where conditions permit, by improving student engagement through multimedia instruction, enabling more efficient monitoring and administration, and connecting teachers to professional resources beyond their immediate environment. Teachers who have experienced these benefits describe digital classroom management not as an imposition but as an enhancement, a means of doing their jobs more effectively and reaching students more meaningfully. Yet these opportunities remain unevenly distributed and persistently fragile. Infrastructure failures undermine even the most committed digital initiatives. Teacher digital literacy gaps limit who can participate in digital transformation. Financial constraints create unsustainability and inequity. Policy and leadership gaps leave schools navigating complex challenges without adequate guidance. Resistance, whether from skepticism or from rational calculation about costs and benefits, limits adoption. The Technology Acceptance Model has proven valuable for interpreting these findings, illuminating how teachers' perceptions of usefulness and ease of use mediate between technology provision and actual classroom practice. Teachers adopt digital tools when they perceive genuine value and find tools accessible; they resist or abandon them when these conditions are absent. This framework reveals that technology acceptance is not simply a matter of teacher attitudes but emerges from the complex interplay of infrastructure, training, support, policy, and

experience. Several implications for policy emerge from this analysis. First, educational technology strategies must move beyond hardware-centric approaches to address the full ecosystem within which digital classroom management must function. Device provision without electricity, training without connectivity, and pilot projects without sustainability plans will continue to generate disappointing results. Holistic approaches that simultaneously address infrastructure, capacity, policy, and support are essential. Second, equity must be central to digital transformation efforts. The urban-rural divide documented in this study threatens to create a two-tiered education system where technology advantages accrue to already-advantaged schools. Deliberate strategies to support rural and disadvantaged schools through appropriate infrastructure solutions, targeted capacity building, and sustained investment are necessary to prevent technology from widening educational inequalities. Third, teacher development must be conceptualized as ongoing, context-embedded, and practice-focused rather than as one-time training events. The teachers who developed sophisticated digital practices in this study did so through peer learning, problem-solving, and sustained engagement, not through formal courses alone. Professional development systems should support these organic learning processes while providing structured opportunities for skill development. Fourth, research and knowledge generation must be strengthened. The limited empirical research on digital classroom management in Sierra Leone means that policy decisions are often made on the basis of imported assumptions or anecdotal evidence. Investing in locally-generated research, building Sierra Leonean research capacity, and ensuring that evidence informs policy would strengthen the effectiveness of educational technology initiatives. Future research should address questions this study raises but cannot fully answer. Longitudinal studies could track how digital classroom management practices evolve over time as infrastructure improves, teachers develop competence, and policies mature. Comparative research across West African contexts could illuminate which challenges are specific to Sierra Leone and which reflect regional patterns. Intervention research could test specific strategies for supporting digital classroom management, generating evidence about what works in local conditions.

Student perspectives, while included in this study, deserve more sustained attention in future research. The COVID-19 pandemic has permanently altered global education, accelerating digital integration in ways that would have seemed unimaginable just a few years ago. Sierra Leone's schools are part of this global transformation, even as they navigate distinctive challenges rooted in post-conflict reconstruction and persistent development constraints. Understanding how digital classroom management actually operates in these conditions, not as an idealized vision but as lived practice, is essential for ensuring that technology serves educational goals rather than distracting from them, that digital tools enhance teaching rather than complicating it, and that all students, regardless of location or circumstance, benefit from what technology can offer. This study has aimed to contribute to that understanding by listening carefully to teachers, students, and school leaders; by analyzing their experiences through a robust theoretical lens; and by generating insights that can inform more effective policy and practice. The journey toward effective digital classroom management in Sierra Leone is neither simple nor short. But with evidence-informed approaches, sustained commitment, and attention to the complex realities of schools and classrooms, it is a journey worth undertaking.

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**HOW TO CITE:** Aiah Joseph Kamanda\*, Digital Classroom Management in Secondary Schools in Sierra Leone: Opportunities and Challenges, *Int. J. Sci. R. Tech.*, 2026, 3 (3), 280-296. <https://doi.org/10.5281/zenodo.19023060>