An Investigation of ICT Strategies Implemented by School Leaders to Enhance Early Childhood Class Management: A Case Study of Harare Primary Schools

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Abstract

Digital technologies are increasingly reshaping global education systems; consequently, integrating Information and Communication Technologies (ICTs) into Early Childhood Education (ECE) has become a critical priority for educational stakeholders. This qualitative study sought to understand how school leadership's ICT-oriented strategies enhanced the management of Early Childhood Development (ECD) classes across Harare Northern Central District. Using purposive sampling, in-depth interviews were conducted with 10 school heads and administrators from public, trust and private institutions. Anchored in Social Cognitive Theory, the study employed thematic analysis to identify recurring patterns and meanings within the data. Findings reveal that while school leaders actively pursued ICT integration, their approaches varied significantly based on resource availability, policy clarity and access to training. Key strategies identified include ICT infrastructure development, curriculum alignment with digital tools, enhanced leadership training and the establishment of monitoring mechanisms. However, implementation was mainly hindered by infrastructural development gaps, low digital competence among staff and inadequate support systems in relation to technology usage. In response to these challenges, school leaders proposed context-driven solutions such as tailored professional development, strengthened school-community partnerships and enhanced government support. Based on these insights, the study recommends the formulation of localised ICT integration frameworks, investment in digital infrastructure at the ECD level and the promotion of inclusive ICT capacity-building initiatives for educators and school leaders. Further research should explore the impact of specific ICT tools on ECD learning outcomes and conduct longitudinal studies to assess the long-term effects of leadership strategies on digital integration in early education settings. This study contributes to and extends policy debates on equitable digital transformation in Zimbabwe's early education.

Key concepts: Early Childhood Development classes, Information and Communication Technologies, ICT tools.

Introduction

The effectiveness of a school is directly tied to the quality of its administration and leadership (Usman, 2016). School administration is responsible for coordinating and allocating resources to achieve educational goals. Effective and efficient school leadership is thus, fundamental in achieving educational excellence. However, traditional management approaches may no longer suffice in addressing the increasing complexity of educational institutions (Nguyen, Tran and Duong, 2023). This signals the need for research into modern, more efficient administrative and leadership practices, such as ICT-oriented strategies, particularly in under-researched areas like Early Childhood Education.

In recent years, literature on Information and Communication Technologies has reshaped our understanding of the administrative landscape in education. ICTs refer to a broad set of tools, including hardware and software used to communicate, store and manage educational information (Mwambo, 2019). The increasing integration of ICTs into school systems has

transformed how data is handled, how communication flows and how decisions are arrived at. However, while there is growing global interest in the digital transformation of educational management, there is a dearth of empirical data on how these tools are actually used in primary school leadership especially within early childhood programmes. This underscores the need to explore and document these practices in local contexts like Harare in Zimbabwe.

Globally, ICTs have been embraced in educational management, enhancing efficiency, accountability and stakeholder engagement (Zhang, 2023). In Africa, the uptake of ICTs in school management and leadership has historically lagged behind other sectors, although there has been a gradual shift in recent years (Mwadulo and Odoyo, 2020). In Zimbabwe, for example, the government's *Curriculum Framework for Primary and Secondary Education (2015–2022)* mandates the integration of ICT across all learning areas. While this policy framework provides a foundation, its practical implementation especially in ECD remains unclear. The question remains: how do participants of this study describe the ICT strategies implemented by school leaders and their teachers to enhance early childhood class management?' This question raises the need for investigating whether school leadership in Harare are translating these policy directives into action in ECD settings. Findings have the potential to inform policy on enhancing these strategies.

School administrators now have access to digital platforms that they can use to streamline various administrative tasks and assignments ranging from student data management to financial management, school budgets, communication and staff development. Tools such as Management Information Systems (MIS), online training modules and social media platforms are changing how schools function including levels of performance (Shah, 2014; Mwalongo, 2019). However, it is unclear how widely or effectively ICT tools are used in ECD management in Zimbabwean schools. Targeted research is required to identify gaps, find best practices and capture the current usage landscape.

Despite the benefits, the adoption of ICTs in school management, particularly in early childhood education has been constrained by various challenges. These include lack of developed infrastructure, limited funding, unstable internet connectivity and inadequate digital competencies among school leaders (Mingaine, 2013; Flanagan & Jacobsen, 2003). Numerous administrators report difficulty in leading ICT adoption due to limited training and support (Apsornet al., 2019). These barriers highlight the importance of investigating both the presence of ICTs and the leadership capacity to manage and implement them effectively, ensuring efficiency in the entire systems, especially at the foundational level of education.

Moreover, Early Childhood Education has often been sidelined in discussions around educational leadership and innovation. This implies leadership should create and develop professional development opportunities that are specifically designed to address targeted or particular needs, goals and or challenges of individual teachers, groups of teachers, or schools rather than using a one-size-fits-all approach. Therefore, targeted professional development focuses on specific subject areas or teaching skills that include digital literacy, classroom management and differentiated instruction.

Meanwhile, effective management at this foundational stage is crucial for lifelong learning outcomes. There is limited research on how ICTs can enhance administrative practices in ECD, particularly in urban primary schools in Zimbabwe. Understanding how ICTs are applied in ECD management to promote effectiveness and efficiency can contribute to improved policymaking, professional development programmes and resource allocation (Zingwena & Kuyayama, 2024).

This gap makes it imperative to discover how school leaders in Harare's Northern Central District manage ICTs for ECD success. Against this background, there is a clear gap in the literature and practice regarding ICT- oriented management strategies in ECD in Zimbabwe. Although national policies promote ICT integration, little is known about how school administrators in Harare are implementing these strategies specifically in ECD classes. Furthermore, there is a need to understand the impact of these ICT strategies on teaching and learning, as well as the specific challenges faced by school leaders in this context.

Purpose of the Study

To evaluate how school leaders utilise their management tools in ECD programmes to minimise challenges and inform future educational leadership practices.

Research Questions

1. How do participants describe the management strategies employed by school leaders to supervise ECD classes?
2. What challenges do schools in the district under study encounter during the implementation and usage of ICTs in managing ECD programmes?
3. What strategies do participants suggest for school leaders to improve the implementation of ICTs in managing ECD programmes?

Rationale of the Study

In the 21st Century, the integration of Information and Communication Technologies in education has become a critical tool for refining school management effectiveness and efficiency. Globally, ICTs are increasingly recognised as tools for improving administrative effectiveness, data-driven decision-making, communication and the overall governance of educational institutions. In Zimbabwe, the *Curriculum Framework for Primary and Secondary Education (2015–2022)* outlines the adoption of ICTs as a national priority across all sectors, education included. As such, school leaders are expected to drive ICT innovation not only through classroom instruction, but in the administration and management of educational programmes.

While significant attention has been given to ICT integration in teaching and learning, particularly in junior, secondary and tertiary education, there is a persistent and conspicuous gap in research regarding the role of ICTs in the management of Early Childhood Development programmes. This gap is even more pronounced in developing countries such as Zimbabwe, where resource constraints, digital infrastructure challenges and uneven ICT training for school leaders persist (Chafa & Muzangwa, 2024). The Organisation for Economic Co-operation and Development (2017) widely recognise Early Childhood Education as the foundation of a child's academic and developmental journey. As such, the effective management of ECD programmes is critical to ensuring that foundational education is delivered in a structured, efficient and child-centred manner. However, little is known about how ICTs are being leveraged by school leaders to increase effective management of these programmes. This opening is particularly obvious in urban primary schools such as those in Harare. This study was motivated by the need to explore the practical realities of ICT-oriented management practices in ECD settings. Specifically, the study sought to examine the extent to which school administrators incorporate ICT tools in planning, supervising, monitoring and decision-making processes within ECD programmes.

The findings were expected to contribute valuable insights for informed decision-making among policymakers, guide the development of targeted capacity-building programmes for

school administrators and promote the strategic and context-appropriate integration of ICTs in early childhood education. Findings of the study have potential to provide a model that may be applicable in similar urban settings in Zimbabwe and other developing countries. Ultimately, this study is anchored on the premise that school leadership plays a pivotal role in educational transformation. Understanding how ICTs can raise effectiveness and efficiency at the foundational level of education will help inform sustainable interventions that strengthen early childhood education management practices in the digital age.

Theoretical Framework

This study is grounded in Albert Bandura's Social Cognitive Theory (SCT), understanding how school leaders adopt and implement new knowledge like ICT-oriented strategies in the management of Early Childhood Development (ECD) programmes and to implement related strategies. Bandura's Social Learning Theory (1977), also known as Social Cognitive Theory, emphasises the dynamic interaction between personal factors, behaviours and environmental influences during teaching-learning processes. It highlights the critical role of observational learning, imitation and modelling in human behaviour. It is particularly relevant in explaining how individuals acquire new knowledge and behaviours, such as ICT use, learnt through observation, modelling and belief in their own capabilities.

In the context of this study, school leaders may learn how to manage ECD classes using ICTs by observing colleagues or ICT specialists and replicating effective practices (Bandura & Hall, 2018). Modelling enables them to emulate successful strategies that improve efficiency and communication, thereby shaping their own management practices (Nabavi, 2012). Additionally, self-efficacy, a key component of SCT, explains how confidence in one's ability to use ICTs can motivate persistence and innovation, even in the face of challenges (Ghazi et al.,). As such, SCT allowed this study to examine how ICT-related behaviours among school leaders are shaped by their environments and social interactions, while also recognising that these behaviours can in turn influence institutional culture and ICT adoption practices.

Research Design and Methods

This qualitative research design examined the experiences, perceptions and practices of school leaders regarding ICT-oriented management strategies in Early Childhood Development. Creswell (2014) puts forward that, qualitative research designs are particularly effective for generating rich, descriptive oral data that offer a profound understanding of a social phenomenon, especially when the aim is to gain deeper understanding of complex human behaviour and institutional practices. The study was conducted in Harare Metropolitan Province's Northern Central District. This district hosts a concentration of former Group A and elite schools which are generally enhanced with resources that exhibit greater ICT integration than other areas, making them ideal for the focus of this study.

The target population comprised of purposefully selected primary school leaders from public and private institutions. Similar to literature, these school leaders were selected because they hold key responsibilities in planning, implementing and managing school policies and practices, including ICT integration in ECD settings (Bush, 2008). A purposive sampling strategy, as recommended by Patton (2002) was employed to select information-rich participants with substantial knowledge and practical experiences related to the research focus. The District Schools Inspector (DSI) indicated that there were 38 formal primary schools in Harare Northern Central District at the time of the study. From this population, ten (10) school leaders were purposively selected to participate in this research. The participants included four males and six females, representing a mix of public, private and trust schools. All participants held a minimum qualification of a Bachelor of Education (B.Ed.) and the highest with a Master

of Education (M.Ed.), aligning with the minimum qualifications required for school leadership roles in Zimbabwe. Three participants were aged between 40 and 49, six between 50 and 59, and one participant was over 59 years old. These demographic characteristics were collected before the interviews and ensured a varied sample in terms of age, gender and school type.

Data Collection Methods and Procedures

Data were collected using semi-structured interview guides, which allowed the researchers to probe participants while giving them the flexibility to elaborate on their experiences (Kvale & Brinkmann, 2009). The interviews provided a platform for school leaders to reflect on their use of ICTs in managing ECD classes, the challenges they face and the strategies they adopt. Semi-structured interviews are particularly useful in qualitative research for gathering detailed and context-specific data (Creswell & Creswell, 2017). Each participant was contacted and booked for an interview at least one week in advance to accommodate their demanding schedules. Interview questions were shared prior to the sessions to help participants reflect and prepare.

Data Analysis

The recorded interviews were transcribed electronically and analysed manually by the two researchers. Guided by experts Krippendorff (2013)'s guidelines for content analysis, the researchers read each transcript multiple times to identify key words, recurring patterns and themes. Thus, anchored in Social Cognitive Theory, the study employed thematic analysis to identify recurring patterns and meanings within the data. Coding was done inductively based on the research questions and emerging insights from participants' narratives. The use of semi-structured interview questions across all participants also allowed for thematic comparability across different school types (Vanderstoep & Johnston, 2009). Transcripts and audio recordings were reviewed collaboratively, and revisions were made until both researchers reached consensus, ensuring internal consistency and reliability in interpretation. Although interviews offered rich insights, they were not without limitations. As Denzin et al., (2017) caution, interviews may be constrained by participant accessibility and the social desirability of responses. In this study, the primary limitation was scheduling conflicts, which were addressed through flexible planning and participant-centred arrangements.

Findings and Discussions

The key findings emerging from the interviews conducted with primary school leaders in Harare Northern Central District are organised thematically in alignment with the research questions and are interpreted in relation to current literature. Through the voices of participants, the section explores the strategies school leaders employed to ensure effective management of ECD classes using ICTs. Participants also shared the perceived benefits and enhancements ICTs bring to ECD programme quality including the challenges faced in their implementation and suggested solutions. Direct quotes were included to support the interpretation of data and to preserve the authenticity of participants' perspectives.

What Strategies were employed in managing ECD classes using ICTs?

ICT infrastructure development

The development of ICT infrastructure plays a pivotal role in fostering a culture of technology use and innovation within ECD settings. Findings under this theme reveal that school leaders, despite facing considerable resource constraints, adopted the strategy to establish ICT infrastructure to leverage collaborative networks, including parents' boards and alumni associations. For the participants, the stakeholder alliances were instrumental in mobilising both financial and material support, demonstrating that infrastructure development in education is not only technical but deeply social and community driven. The importance of infrastructure development in the schools could be meaningfully understood through the lens of Social

Cognitive Theory (Bandura, 1986), which underscores how behaviour change and learning occur through the dynamic interplay of personal factors, environmental conditions and observed practices. For instance, when school leaders' model proactive engagement and innovation in mobilising ICT resources, they not only shape the physical environment but also influence the beliefs and efficacy of both teachers and learners within their institutions. As one principal from a private school advised:

> *There are a number of approaches to encourage use of ICTs, but the major one is availability of ICT infrastructure. I have discovered that, as an administrator, you can encourage professional development for educators…ICT infrastructure development enhances motivation for training opportunities for teachers on how to use technologies for teaching-learning effectively. This not only empowers them with new skills but also fosters their confidence in using ICT tools… ideally, when teachers are knowledgeable, they are more likely to incorporate ICTs in their lessons* (Principal, Private School B).

This study reflects the central idea of self-efficacy within Social Cognitive Theory, which is, belief in one's capabilities to perform tasks effectively. By providing both the tools and the environment to teach and learn, infrastructure development acts as a mediator of positive leadership behaviour change, enhancing teachers' motivation and willingness to adopt digital tools in their classrooms. For example, one school head from a public school extended the discussion on the transformative potential of infrastructure on early exposure of teachers and learners to technology:

> *Developing ICT-related infrastructure plays a foundational role in building a culture of ICT usage by educational management. We enable, encourage and institutionalise digital practices across the school. So, the culture does not emerge instantly on its own, but it is cultivated through consistent use, leadership modelling and supportive policy. When ICT infrastructure is availed in ECD settings, it helps create a positive culture towards using technology. These young children adopt a natural and enthusiastic approach to technology, which will likely build a foundation for life-long learning. This is consistent with Zimbabwe's Vision 2030 goals* (School Head A).

In line with Social Cognitive Theory, this comment illustrates how the environment, in this case, an ICT-enabled classroom, supports observational learning. Young children, exposed to technology in meaningful ways, internalise positive attitudes towards digital literacy and they carry them forward into later learning contexts. The development of ICT infrastructure lays the groundwork for a sustainable culture of ICT use in educational management as it, provides tools, reinforces daily habits, enables the spirit of collaboration, supports electronic data usage and fosters teacher professional growth. This is why it is critical for leaders to foster the culture. Similarly, a Trust School Director emphasised the social dimensions of ICT infrastructure:

> *ICT infrastructure aids better communication and collaboration among teachers, parents, the community and our ministry officials. In this school, for example, we have effectively used emails, WhatsApp group chats and broadcasts to keep parents informed about their children's progress. If a school develops ICT infrastructure to support ECD programmes, it ensures equal opportunities for all children, regardless of their socio-economic background... here the school bridges both digital and educational gaps, thereby promoting inclusivity* (Director B, Private School).

This points to how ICT infrastructure supports reciprocal determinism, the mutual influence of social networks, policy structures and behavioural practices in shaping inclusive learning

environments. Schools that establish robust infrastructure also build stronger social systems of accountability, communication and shared learning. Despite such successes, the study revealed persistent inequalities in infrastructure across school types. Private and trust schools had made substantial progress due to their capacity to mobilise community and financial resources. In contrast, public schools continue to face infrastructural deficits rooted in erratic government funding, inefficient procurement systems and limited technical support.

These findings are congruent to an earlier study by (Mtebe & Raisamo, 2014), which identify unreliable electricity, poor internet connectivity and low maintenance issues as key challenges and barriers to ICT integration in Sub-Saharan Africa. The disparities observed by these researchers in Harare's Northern Central District reflect broader structural inequalities, where well-resourced institutions are equipped to drive digital transformation, while under-resourced schools remain stuck in analogue paradigms. Resultantly, the findings of this study highlight a growing digital divide among ECD institutions, which undermines the goals of equity, access and inclusivity enshrined in Zimbabwe's Vision 2030 and global frameworks like SDG 4 delivery of Quality Education. Bridging this divide requires more than just building a physical infrastructure. It demands leadership that models innovation, policies that incentivise provision of resources equitably and community practices that reinforce technology use through meaningful participation. Ultimately, applying Social Cognitive Theory highlights that infrastructure alone is not sufficient but requires an interplay of environmental support, social modelling and individual efficacy all of which determine whether ICTs become tools for transformation or symbols of exclusion in early education.

Curriculum integration, aligning ICT usage with pedagogy in early childhood development

According to Pakombwele and Tsakeni (2024) the integration of Information and Communication Technologies into Early Childhood Development curricula offers transformative opportunities for both learners and educators. Effective curriculum integration not only enhances pedagogical practices but also fosters learner engagement, motivation and differentiated instruction. However, such integration is influenced by a complex interplay of policy, institutional readiness, teacher capacity and resource availability.

Findings from this study suggest that in schools where ICT infrastructure and leadership support are well established, ECD educators demonstrate greater confidence and creativity in embedding technology into their lesson planning and delivery. For instance, a director from a private school explained that their institution had a policy mandating every teacher to incorporate ICT tools into teaching and learning. According to the director, this policy has made learning more interactive and engaging, and as a result, students remain motivated. This example highlights the importance of environmental factors, which are a key component of Social Cognitive Theory (SCT). Bandura (1986) emphasises that behaviour is shaped into a culture by the interaction of personnel, behavioural and environmental factors. In this case, taught knowledge becomes the teachers' culture because they will have internalised and lived it. When individuals not only know something intellectually, but they begin to act on it, embody it and make decisions based on it without needing to think consciously about it, it will have become part of their worldview. In this case the use of ICTs moves from just being the abstract to the habitual or customary. That taught knowledge about use of ICTs becomes a culture when teachers and learners have absorbed, begin to share and enact it until ICTs usage becomes second nature and is no longer just taught. In this case, the institutional policy and supportive context foster teachers' self-efficacy, reinforcing their confidence in adopting ICTs in classroom practice. The use of technology such as digital storytelling applications, educational games and interactive whiteboards illustrates how ICTs digital tools can enrich learning when they are purposefully integrated into teaching. A School Principal B in this study observed the

benefits of ICTs integration in promoting individualised learning:

> *Personally, I have observed that ICTs enable learners to work at their own pace and during their own time. That way, the teacher caters for individual differences. Look here, I believe that integrating ICTs in daily individualised learning offers a number of benefits. For example, in this school we have noticed that it brings with it personalised learning speed where our students learn each at their own speed, revisiting content or advancing as needed. ICTs also help to adapt, or tailor match the teaching-learning content basing on the individual strengths, weaknesses and learning styles. For ECD learners, it surely increases learner engagement since the interactive tools, multimedia content and gamified platforms make learning more engaging and motivating* (Principal B, Private School).

A number of lessons emerged from this citation, they help teachers to adapt the teaching-learning tools to provide immediate real-time feedback, and they help learners to correct their own mistakes and improve quickly. Is it not true that effective learning comes from the mistakes learners make? Therefore, we can conclude that ICTs empower, are more effective, engaging and provide personalised learning experiences. These examples given by the participant reinforce the Social Cognitive Theory principle of personal agency, where teachers, confident in their understanding of the value of ICTs, can design adaptive learning environments that respect learners' cognitive and developmental differences. This approach agrees and confirms Yelland (2011)'s findings that, effective ICT integration involves embedding digital tools meaningfully within teaching and learning processes to enhance educational outcomes, rather than using technology as an isolated activity.

However, the study also revealed significant systemic barriers, particularly in public schools, where ICTs integration remains inconsistent and often poorly and randomly supported. A public-school head remarked:

> *Although I appreciate the benefits of integrating ICTs in teaching-learning, my teachers always complain about sharing ICT tools that are outdated. At times, some of them end up abandoning the planned lessons due to the unavailability of resources. This is frustrating and discouraging. The use of ICTs should be embedded in their daily practices including symbols. Only when teachers use ICT tools naturally can the idea of using culture arise. It is only when the knowledge of use of ICTs becomes embedded in daily practices, just like how people eat, dress, work or use language and rituals. Once knowledge informs how we celebrate an event or how people greet each other, then it has become part of culture. However, in this school, teachers do not have the tools, they share* (Public School Head A).

This quote illustrates and emphasises the reciprocal relationship between the environment, motivation and action, as posited in SCT. When the school environment lacks adequate digital tools or presents logistical challenges, even highly motivated teachers may abandon ICT integration efforts, which in turn undermines the learning experiences. This also reflects a broader policy-practice disconnect, where ICTs are championed in educational policy as a cross-cutting theme, yet the operational support at the classroom level remains minimal or non-existent.

In a few well-resourced schools, ECD teachers were observed incorporating digital storytelling, interactive applications and educational games that aligned with specific learning outcomes. Similar to findings in literature reviewed for this study, practices represent a purposeful and pedagogically grounded use of ICTs (Yelland, 2011). Yelland emphasises that effective

integration only occurs when digital tools are fully embedded in core learning activities, rather than treated as supplementary or separate tasks. However, across many schools in this study, ICT usage has remained superficial and sporadic, failing to align with curricular goals. Participants aligned it to inconsistency and insufficient training in digital pedagogy, limited access to age-appropriate content and unclear expectations from curriculum planners. Without these enabling conditions, ICTs are at the risk of being marginalised in early education, despite their recognised potential.

Training and support in ICT integration for school administration and teachers

The integration of ICTs into ECE contexts is a process heavily dependent on proper training and continuous support both for teachers and school leaders. Findings from this study revealed that where adequate training and support systems are in place, ICTs use is more effectively incorporated into daily educational practices. However, significant gaps continue, particularly in public schools, where resources for training and technical support are heavily limited. One school leader from a government school noted the need for leadership training in ICT, reflecting a common challenge faced by school heads:

> *At this school and others in this zone, we experience several common challenges when attempting to integrate ICTs in our schools especially those leading rural and peri-urban schools. For example, as you see in this school, there is limited infrastructure to support ICTs implementation for 2500 students. ECD requires special infrastructure, but look, we cannot afford it. Our school has issues with basic infrastructure such as electricity, telephone networks, reliable internet and computer labs... Secondly… inadequate funding where budget constraints make it difficult to purchase ICT equipment, maintain it, or even invest in software and connectivity. If we have them, leadership training in ICTs would help me utilise them better. At present, I depend on teachers to guide me since they are the ones who got appreciation from teachers' colleges* (School Head A, Government School).

This highlights the importance of leadership competencies in ICT, as emphasised in Social Cognitive Theory (Bandura, 1986), which underscores the role of self-efficacy and environmental factors in shaping behaviours. School leaders who lack ICT competence may struggle to provide the necessary guidance, leaving teachers to navigate the integration process without sufficient support. Similarly, another school leader from a public institution expressed frustration at the limited support provided by the Ministry of Primary and Secondary Education:

> *It is surprising that our Ministry of Primary and Secondary Education (MoPSE) expects us to use ICTs, but it offers very little support. We have since requested for government-paid technicians including security, but there is no hope of getting them. If we attend workshops, there is no follow-up after those workshops. In schools where there is infrastructure, you will meet shortages of skilled staff. The availability becomes a challenge in its own right. Teachers and leaders often lack adequate ICT training, limiting effective integration into teaching and administration of school issues. Without training, the environment becomes intimidating thus causing resistance to change. Some teachers and stakeholders may resist or may be slow to adopt new technologies due to fear, lack of exposure, or entrenched traditional methods* (School Head B, Public School).

Lack of Professional Development

This statement reflects the inconsistency between policy expectations and practical realities. Scholars like Law and Chow (2008) argue that one-time workshops are insufficient for sustained ICT integration, and the lack of follow-up or continuous professional development

severely hampers the long-term effectiveness of ICT use in classrooms. In contrast, school leaders from private and trust schools have embraced a more structured approach to ICT integration. One private school principal shared:

> *As a school, we have a policy where most of our activities have become virtual. As such, it has become mandatory for everyone in this community to become well-versed in ICTs. We mainly rely on donor-funded programmes to train our staff, but these are not permanent. As a result, there is no consistency in our training programmes* (Principal, Private School).

Another head from a trust school described a more structured approach to teacher development:

> *In this school, we have a board of directors that manages all the business here. For instance, we have identified strategies to encourage use of ICTs, among which are training and a powerful support system. Teachers and other staff members attend scheduled training programmes and workshops every new term. On top of that, we have acquired cell phones and laptops connected to the school's unlimited Wi-Fi. The technicians are always ready to assist anyone who might have challenges* (School Head A, Trust School).

These proactive measures, which include regular training sessions, access to resources and on-site technical support, illustrate how a supportive environment, critical to fostering ICT use, aligns with the principles of Bandura (1986)'s Social Cognitive Theory. According to Bandura (1986), an individual's behaviour is influenced by their environment, including access to resources, support systems and opportunities for mastery experiences. In these schools, educators are empowered to integrate ICTs confidently and creatively into their teaching practices. The study also found that schools with strong support networks, including partnerships with parents and alumni, were better positioned to resource ICT laboratories and provide ongoing professional development for teachers. One director noted:

> *This school has a powerful team of parents and alumni who have pledged to support the school with everything and anything to do with ICTs. They have taken the responsibility to resource our ICT laboratories and classrooms. Overall, they oversee the training needs of teachers and other staff; this has helped boost our ICT culture at this school* (Director, Private School).

The participant confirms the view that when the knowledge becomes invisible and is no longer questioned or examined but is just seen as 'the way things are,' then it has truly become culture in that school. This collaboration emphasises the reciprocal nature of Social Cognitive Theory, where individuals' actions (teachers, students, school leaders) are influenced by the behaviour of others in their environment. The involvement of parents and alumni creates a positive feedback loop that fosters a culture of ICT adoption. However, across the majority of schools, especially in public institutions, the study revealed significant challenges related to the lack of structured support systems. This finding is consistent with UNESCO's (2014) assertion that providing technology without adequate training or support undermines its educational potential. Furthermore, the lack of technical support was a recurring theme in the findings.
Many teachers reported relying on trial-and-error methods or peer assistance to troubleshoot technological issues in the classroom. As one teacher remarked, "*We were given tablets, but no training. Most of them are still locked in the cupboards."* This illustrates the gap between policy intentions and classroom realities, highlighting the need for continuous, context-specific professional development. Law and Chow (2008) stress that ICT integration requires ongoing support, and not just initial training, to ensure teachers are able to continuously refine their skills and adapt to technological changes. From the perspective of school leaders, many

reported that they lacked ICT competencies themselves, which hindered their ability to offer effective guidance and mentorship to develop a culture of ICTs usage. This lack of leadership training creates a situation where ICT integration remains peripheral rather than central to the school's development agenda.

Thus, findings of this study indicate that effective ICT integration in Early Childhood Education relies heavily on sustained training and support systems for both teachers and school leaders. Schools with structured training programmes, strong leadership and reliable technical support systems reported higher levels of ICT integration and greater teacher confidence. Conversely, the lack of training and support resulted in underutilised resources, which undermined the potential impact of ICTs in the classroom. The study suggests that for ICT integration to be successful, it must be supported by consistent professional development, leadership that models best practices and adequate technical and resource support.

Monitoring and evaluation as a strategy for enhancing ICT integration

The study discovered that Monitoring and Evaluation (M&E) mechanisms emerged as a central strategy that can be used by school leadership to ensure the meaningful integration and sustained use of ICTs in early childhood education. Drawing on Social Cognitive Theory (Bandura, 1986; 1997), the findings demonstrate effectively how structured monitoring practices interact with teacher behaviours and personal factors, particularly motivation and self-efficacy, to foster technology integration in pedagogical practice. School leaders who had implemented formal M&E systems reported a noticeable improvement in ICT adoption among teachers. A school head from a public school explained how regular reporting requirements transformed previously idle technological infrastructure into active teaching tools:

> *I must share that this school has managed to install a projector and an interactive board, in addition to the laptops purchased for teachers. However, before we started monitoring ICT use, most of these tools remained idle. Now each teacher must report monthly on how they use ICTs on a day-to-day basis. As an administrator, I have an obligation to report to the School Development Committee (SDC) who mobilised the resources* (School Head C, Public School).

Clearly, the practice reflects the reciprocal determinism at the heart of SCT, where environmental structures (monitoring systems), behavioural outcomes (related use of ICT), and personal factors (teacher motivation and accountability) interact to reinforce change. The study discovered that these feedback loops played a critical role in shaping teacher motivation and confidence, particularly in using technology effectively in classrooms until it became a culture. Monitoring acted as an environmental stimulus that shaped teacher behaviours and elevated personal responsibility, leading to increased technology use. Teachers who received regular feedback on their ICT application to teaching were therefore more likely to engage with the tools provided for and reflect on their practices, thus enhancing their overall teaching performance. This confirms Bandura (1986)'s assertion that feedback mechanisms and accountability processes can positively influence personal and behavioural factors.

Monitoring and Evaluation systems also provided a basis for teacher accountability and self-reflection, leading to improved pedagogical practices. In some private schools, ICT use is tracked and reviewed systematically as part of school-wide evaluation: School Head B, *said,* "Here we now track ICT integration in our end-of-term reviews". This has made a significant improvement in how teachers approach lessons." This aligns with Zimmerman's (2000) conception of self-regulated learning, where regular evaluation enables goal setting, performance monitoring and reflection key mechanisms for reinforcing self-efficacy. Teachers used M&E data to adjust their strategies and measure their growth, enhancing their confidence

in using ICT tools.

Despite the positive impact of M&E systems in some schools therefore, an observed significant challenge identified in this study was the absence of formal M&E structures in several schools. In such cases, ICT integration was inconsistent, and the lack of structured feedback mechanisms led to low self-efficacy among teachers. One private School Head expressed this concern, saying, "*Most of the schools focus on human and resource inventory instead of tracking the actual usage of ICTs in teaching and learning*". The absence of formal M&E systems limits teachers' opportunities to receive meaningful feedback on their ICT use, which, according to Social Cognitive Theory, weakens the reciprocal interactions between personal, behavioural and environmental factors. According to Bandura (1997), without environmental support and feedback, individuals are less likely to develop the personal agency and behavioural change needed for innovation. The lack of data-driven evaluation leaves teachers without the guidance and motivation necessary for effective technology use. As Tondeur et al. (2016) suggest, without continuous monitoring and reflection on teaching practices, the effective integration of ICTs is significantly hindered. Teachers in schools without these structures were often left to their own devices, leading to disengagement and underutilisation of ICT resources. This finding demonstrates the negative consequences of absent or ineffective monitoring.

School leaders emphasised that M&E systems created structured feedback loops that enhanced both individual and institutional learning. Reporting mechanisms made ICT usage become cultural standards for practice that were transparent and encouraged continuous improvement. By requiring teachers to document how they applied technology, M&E systems positioned ICT not as an optional tool, but as a measurable component of professional performance. The integration of evaluation into everyday teaching routines made the use of ICTs more sustainable and normalised within the school culture. The findings underscore the strategic importance of Monitoring and Evaluation systems in shaping teacher behaviours and institutional culture around ICT usage. Schools with structured M&E practices reported greater teacher engagement, improved self-efficacy and more consistent integration of technology into instructional practice. These findings validate Bandura (1986)'s Social Cognitive Theory assertion that behaviour change is not solely dependent on personal motivation but is significantly influenced by environmental structures such as monitoring and feedback. Conversely, in schools with low M&E, ICT usage remained sporadic, untracked and weakly aligned with pedagogical goals. Therefore, establishing robust M&E systems is not merely a managerial function but a pedagogical imperative for embedding ICTs in early childhood education.

Challenges of School Management in Implementing ICT in ECD Classroom Practice

The study established that integration of Information and Communication Technologies in Early Childhood Development classrooms remains uneven across public, private and trust schools in Harare. Data collected from the ten school leaders (four males and six females) revealed several interconnected challenges undermining effective implementation of ICTs. When analysed through the lens of Social Cognitive Theory (Bandura, 1986; 1997**)**, these challenges reflect tensions between environmental structures, personal beliefs and behavioural capacities- factors which reciprocally influence teachers' ICT practices.

Financial constraints and weak ICT infrastructure structures

Many participating school leaders cited financial constraints as a major impediment to procuring and maintaining functional ICT tools. This impacts on the environmental factor in SCT, limiting the affordability necessary for teachers to observe, practice and internalise ICT-related behaviours. As one school head illustrated:

> *Reduced funding has negatively affected ICT implementation in our school. Under the current economic climate, we cannot operate effectively to ensure the development of an ICT culture. Our budget is barely adequate for basic supplies, let alone digital tools. Most of the ICT equipment we have here has been donated by one of the neighbouring schools, but it is too old and outdated and therefore requires frequent repairs.* (Head, Public School).

From a Social Cognitive Theory perspective, the scarcity of resources inhibits reciprocal determinism, as the environment fails to enable desired behavioural changes in ICT usage. Consequently, teacher behaviour is constrained not only by lack of tools, but also by the perceived instability of the digital environment, which undermines innovation.

Lack of technical support and consistent maintenance

The absence of in-house ICT technicians leads to inconsistent use and frequent disruptions, eroding teacher confidence. A school director from one private school participating in the study explained, "*We also face challenges with maintenance and technical support. When our machines break down, we do not have an in-house technician, and outsourcing services generally take time and are expensive."*

According to SCT, environments that fail to provide timely feedback and technical reinforcement keep missing opportunities for vicarious learning and performance mastery of key pathways for building self-efficacy. When ICT breakdowns are common, teachers avoid experimentation, fearing negative outcomes or wasted effort.

Limited professional development and low teacher self-efficacy

ECD teachers often lack confidence in their ability to integrate technology into their teaching. A leader from a trust school noted: "*Most of the teachers are not confident with using ICT tools. There is need for a series of professional development workshops to upgrade them."* This reflects a deficit in self-efficacy, a core construct in Social Cognitive Theory that shapes whether individuals initiate and sustain behaviour. Without structured learning opportunities and affirming feedback, teachers perceive ICT as an external imposition rather than a tool within their competence zone (Bandura, 1997).

Resistance to change and absence of observational learning

Teacher resistance to ICT integration, often rooted in habitual reliance on traditional pedagogy, was reported as another major obstacle. One private school head explained: *"We have invested in some gadgets, but the teachers do not always use them. They say it takes too much of learning time and is not suitable for ECD learners."* Here, observational learning is missing. According to SCT, individuals often learn by observing expert models. In environments where no peer successfully demonstrates ICT use in early childhood, others lack the vicarious experience to reshape their own attitudes or behaviours. The environment thus fails to support the behavioural shift.

Policy ambiguity and lack of goal clarity

According to participants of this study, policy ambiguity and lack of goal clarity can significantly impact both teaching and learning in several negative ways. For the teachers, vague policies or goals, may be interpreted wrongly in relation to curriculum requirements, leading to inconsistencies in teaching practices across classrooms. This affects how implementation of ICTs in schools will be done. In academic environments of that nature, learners receive varying quality materials and content of instruction, which can even widen

achievement gaps and cause confusion about learning expectations. Some school leaders commonly pointed to vague policy directives that left them unsure of how to implement ICTs in a developmentally appropriate manner. One school head said, "*You may see teachers handling same grade levels giving very different content materials including quality. You have no standard to place limitation on that because there are no policy guidelines*." Another leader from one participating public school added:

> *We are told to integrate ICT, but there are no clear guidelines or curriculum documents that show how it should be done at ECD level. So, we end up improvising without knowing whether we are on the right track.*

In Zimbabwe, policy ambiguity and lack of goal clarity have undermined the successful implementation of educational reforms like the Competency-Based Curriculum. Teachers are caught between policy rhetoric and classroom reality, while students bear the brunt through inconsistent learning experiences and limited skill acquisition. The challenges faced by school management in implementing ICT in ECD settings are therefore deeply embedded within socio-cognitive dynamics. Financial and technical limitations erode the environmental foundations necessary for behaviour modification, while weak professional development and limited role modelling suppress teachers' self-efficacy and adaptive agency. The findings revealed a need for strategic systems approach grounded in SCT to redesign school environments that actively support observational learning, constructive feedback and empowered self-regulation to overcome ICT implementation barriers.

Suggested Solutions for Enhancing ICT Implementation in ECD Classroom Practice

School leaders offered a range of strategies to address the structural and behavioural barriers affecting the integration of ICT in ECD. These solutions, drawn from participants across public, private and trust schools, reflect an understanding that both environmental support and individual capacity-building are essential. Analysed through the lens of Social Cognitive Theory, these strategies seek to realign environmental inputs, build teacher self-efficacy and foster the conditions necessary for sustained behavioural change.

Regular and context-specific professional development

Participants emphasised the importance of tailored, ongoing professional development focused on ICT use in early learning environments. A public-school leader explained, *"We need regular training programmes specifically for ECD teachers. Workshops should be practical and demonstrate how to use ICT for storytelling, drawing, or counting games, things that make sense for this level."* From an SCT perspective, such training provides mastery experiences, the most influential source of self-efficacy (Bandura, 1997). When teachers acquire practical ICT skills and apply them successfully, their confidence grows, making them more likely to persist in integrating technology.

Peer-led demonstrations and collaborative learning

Several participants recommended using peer-led demonstrations to show how ICT can be applied effectively in the ECD context. A trust school administrator shared, *"We have teachers who are already doing well with ICT. They should mentor others. It is easier when you learn from someone you work with and who understands your classroom reality."* This taps directly into observational learning, a core SCT construct. Watching colleagues' model effective ICT use provides vicarious experiences that boost beliefs in one's own capabilities. It also promotes a community of practice, reinforcing learning through social interaction.

Employing the school-based ICT champions and mentorship

The concept of designating "ICT champions" within schools was proposed to facilitate

sustained support and accountability. These champions would offer on-site assistance, coaching and follow-up. One private school leader stated, “We are thinking of assigning someone to be our ICT point person, someone teachers can turn to when they get stuck. That will make things move faster.” By reinforcing behavioural feedback loops and making technical and pedagogical support readily available, this approach strengthens the reciprocal interaction among personal beliefs, actions and environmental reinforcement.

Incremental resource mobilisation and strategic partnerships

While financial constraints were acknowledged, participants stressed the need for incremental investments and strategic partnerships with NGOs, local businesses and government programmes. One school leader noted, *“We cannot wait for big budgets. Even small gadgets like tablets or phones can make a difference. We also need to be proactive in reaching out to donors or local sponsors.”* This recommendation acknowledges the SCT principle that environmental constraints and enablers must be actively managed to influence behaviour. Gradual improvements to the learning environment create opportunities for success, which in turn boost motivation and competence.

Institutionalising monitoring and feedback mechanisms

Finally, participants called for formalised systems to track ICT use, coupled with regular feedback loops. A private school director remarked, *“We have started collecting monthly ICT reports. However, it is not just about checking boxes, it is about helping teachers reflect and grow. Feedback is very important.”* Such structures enhance self-regulation, a key element of SCT (Zimmerman, 2000). Teachers who engage in self-monitoring, reflection and goal setting are more likely to adopt and sustain ICT use. When this process is supported by positive feedback and recognition, it further strengthens their sense of agency and motivation.

The proposed solutions align with Social Cognitive Theory’s assertion that meaningful behavioural change requires attention to the interplay between personal beliefs, environmental support and observable behaviours. By investing in teacher development, creating supportive environments and facilitating continuous feedback and learning, school management can overcome the barriers to ICT use in ECD classrooms. These interventions not only address practical deficits but also nurture psychological readiness and social engagement, laying the groundwork for a culture of innovation in early childhood education.

Summary, Conclusions and Recommendations

This study concludes that the effective implementation of ICT-oriented strategies in managing Early Childhood Development classes in Harare’s Northern Central District is largely influenced by the vision, adaptability and digital competence of school leaders. Proactive leadership supported by strong monitoring systems and community engagement has been shown to enhance learning outcomes and promote inclusive management practices. However, a persistent gap remains between policy ambitions and operational realities, particularly in public schools. This gap is driven by limited training, inadequate support structures and digital inequities, highlighting the need for a systemic, context-sensitive approach to ICT integration. The research affirms that ICT becomes embedded in school culture only when it is internalised in everyday teaching practices, language and routines ceasing to be a separate initiative and becoming a natural part of how teaching and learning occur. Based on the study's insights and grounded in Social Cognitive Theory, it is recommended that localised ICT integration frameworks be developed alongside strategic investment in digital infrastructure at Early Childhood Development level.

The study emphasises four critical components to ensure effective and inclusive ICT adoption.

These include the creation of structured curricular frameworks, continuous professional development programmes aimed at enhancing educators' digital self- efficacy, visible and supportive leadership that actively models the integration of digital tools and the equitable distribution of resources across all schools. These recommendations collectively support the promotion of inclusive, sustainable ICT capacity-building initiatives for educators and school leaders, ultimately fostering a more enabling environment for ICT use in ECD. Further research should explore the impact of specific ICT tools on ECD learning outcomes and to assess the long-term effects of leadership strategies on digital integration in early education settings. This study contributes to and extends policy debates on equitable digital transformation in Zimbabwe's early childhood education.

Ultimately, the transformative potential of ICTs in early childhood education is realised when integration is approached not as a one-size-fits-all solution, but as a holistic, collaborative leadership process rooted in equity, reflective practice and sustained support. Only when ICT knowledge is absorbed, naturally shared and enacted daily becoming second nature can it be said to have become true educational culture.

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