

# Integrating Artificial Intelligence in School Financial Management: A Case of Nyamakuyo Cluster, Mudzi District

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**Abstract:** As Information Communication Technology (ICT) gradually transforms every sphere of human interaction, a number of organizations have had to go through drastic changes in social connections in the workplace and in business developments. With the rapid development of ICT in the workplace, the use and incorporation of ICT in education in developing countries is also on the rise, predominantly in teaching and learning. Notwithstanding the developments, ICT is yet to pervade other institutional functions, specifically financial management in educational institutions. Hitherto, the effective integration of ICT in financial management leads to enhanced efficiency, transparency and accountability. The use of ICT in financial management also acts as a deterrent to corruption and fraud. This paper explores the integration of ICT in school financial management taking into consideration its role in enhancing the quality of educational management. Most schools in developing countries mix school leaders, teachers, IT technicians and other staff, parents, students and donors establishing a critical social system to be considered if ICT integration is to spur quality in educational management. Subsequently, there must be a match between the institution's organizational culture and the new technology for it to fit in the organization to enhance the quality of educational management. This research employed a cross-sectional design to explore the current practices in financial management and how information Communication Technology is being utilized in schools in Nyamakuyo cluster. This approach aimed to achieve objectivity by providing a snapshot of the existing relationship between ICT applications and financial management practices in schools. In other words, the study described "what" and "how" ICT is currently associated with financial management in this specific context. Research findings disclose that ICT facilitate management of finances in a number of ways. ICT enable financial transactions and the use of money, enhance budgeting and budgetary control, and lessen chances of fraudulent loss of school funds. Also, research illustrates that whereas ICT is necessary, technology leadership is even more imperative for effective use of technology in handling school finances. These findings may be valuable in understanding how to introduce ICT related novelties in schools, and specifically how to use ICT to manage school finances more effectively.

**Keywords:** ICT, leadership, technology leadership, technology integration, financial management, quality of education.

## 1. INTRODUCTION

Both human and material resources are significant in the running of an organization. For schools, the availability and management of resources affects the learning process in schools Akinyele et.al (2021). Finance is a material resource, and the pivot upon which any institution rotates. Financial management is therefore, important for any institution. Brock et.al. (2023) defines financial management as the managerial activity concerned with the planning and controlling of a firms' financial resources. All other organizational verdicts are made in tandem with financial decisions. This implies that an institution's performance is largely based on the way finances are managed. Kumar (2024) identifies the field of financial management to be of immense interest to academicians and practitioners, "...because it is an emerging discipline with many areas where controversies exist, and for which no unanimous agreement has been arrived at" (p. 8).

Correlated issues comprise recording, transfer, use, and accounting for funds. With the introduction and use of information and communication technology (ICT) in the new globalised economy, ICT in financial management is an emergent feature that cannot be ignored because of its role in enhancing management efficiency. ICT has revolutionized every sphere of human interaction, becoming a vital conduit of social change (Brown, et.al. 2022). Many societies have experienced radical changes in the

last decade, partly due to an increased pace of globalization and rapid developments in ICT (World Bank, 2023). The variations resulting from information revolution have transformed the edifice of contemporary societies from industrial to information societies. The transformation has given rise to the emergence of a new universal economy propelled and driven by information and knowledge (Garcia et.al. 2021). In information or knowledge societies, information is formed to be shared spontaneously among persons, groups and across national confines. Such information is directed both vertically and horizontally rather than top-down as is the case with teacher to student or centre to the field as is the case with governments to their various agents such as schools (Garcia, et.al. 2021). Due to these seamless channels of broadcasting, ICT have consequently come to play a ubiquitous role in present businesses, controlling more or less every facet of modern living (UNESCO, 2024). Nevertheless, even with the considerable improvements that most sectors of the economy are gaining from information revolution, the speedy evolution in technology and the emergence of the novel knowledge economy have put sombre challenges on education (UNESCO, 2024). Although ICT incorporation is high in the West, most developing countries continue to be most affected by these challenges. Lack of ICT policies, shortage of funds to acquire ICT gadgets, limited skills, negative attitudes and unsupportive cultures continue to challenge schools in developing countries (UNESCO, 2024). In spite of these challenges, schools have continued to put efforts to acquire ICT gadgets for various purposes. Furthermore, while the problem of access to computers and other ICT gadgets persists in many schools, researchers argue that school authorities are unable or reluctant to use ICT in their operations even in schools with ICT gadgets (Liu, et.al. 2023).

## **2. RATIONALE**

ICTs are aiding tools which open up processes and channels of communication, constructing a universal village where all participants are able to access information without difficulty. Connectivity to the internet further accelerates the exchange of information in real-time. The positive amalgamation of ICT in business financial management and their (ICT) aptitude to augment efficiency, transparency and accountability, acting as a deterrent to corruption and fraud are indisputable (Chene & Hodess, 2009). Regardless of the wide use of ICT in financial management in the business world, various schools have failed to tap the potential of ICT into financial management. Most schools mainly use ICT in lesson delivery, or to teach ICT as a subject. These schools would benefit more if they deployed such ICT in managing their finances.

## **3. KEY INQUIRY QUESTION**

To what extent would ICT integration be effective in school financial management?

## **4. RESEARCH QUESTIONS**

- How does the school leadership facilitate integration of ICT in school financial management?
- How does ICT facilitate management of school finances?

## **5. CONCEPTUAL FRAMEWORK**

Effective school financial management is crucial for educational quality and sustainability. In the 21<sup>st</sup> century, Information and Communication Technology offers potent tools to enhance this process. This framework explores the conceptual and theoretical underpinnings of ICT integration in school financial management, considering various stakeholders and key aspects.

### **5.1. Core Components**

ICT Tools and Systems including financial management information systems integrated platforms enable automated budgeting, accounting, payroll, and procurement (World Bank, 2023). Online Payment Gateways are platforms that schools must secure for collection of fees, donations, and other financial transactions (UNESCO, 2024). Data Management and Analytics Tools facilitate data visualization, forecasting, and informed decision-making (World Bank, 2023). In addition, stakeholders and their roles is another core component. School administration is important in ICT integration in school financial management as it implements and oversees ICT systems, provides user training, and manages data security (Garcia, et.al. 2021). UNESCO (2024) avers that financial officers utilize ICT tools for accurate record-keeping, reporting, and analysis. Teachers and staff are crucial in ICT integration in school financial management for their participation in budget planning, expense claims,

and resource allocation processes (Mhlanga, et.al. 2024). ICT integration in school financial management enables parents and guardians to access fees payment options, school financial reports, and pupils' performance data (World Bank, 2023).

## **6. THEORETICAL FRAMEWORK**

### **6.1. Diffusion of Innovations Theory**

According to Rogers (2003), Diffusion of Innovations Theory explains the process of ICT adoption based on relative advantage, compatibility, complexity, trial ability, and observability. This theory emphasises the spread of new ideas within a social system. Examining ICT integration through this lens helps understand; stages of adoption, drivers of adoption, as well as communication channels. Different schools move through various stages like awareness, interest, evaluation, trial, and adoption or rejection at different paces (Rogers, 2003). Identifying the stage helps tailor adoption strategies. Rogers (2003) further avers that understanding factors like relative advantage, compatibility with existing practices, complexity, and observability of benefits guide strategies for promoting ICT in financial management. Finally, Rogers (2003) argues that identifying key influencers within the school system like administrators, finance officers, and tech-savvy teachers is crucial for disseminating information and addressing concerns.

### **6.2. Benefits of Integrating ICT in School Financial Management**

ICT integration in school financial management increases efficiency, accuracy, and transparency in financial management. It improves budget planning and resource allocation. ICT integration enhances decision-making with data-driven insights. The practice also reduces administrative burden and paperwork. Finally, ICT integration in school financial management increases accountability and stakeholder engagement.

### **6.3. Challenges of ICT Integration in School Financial Management**

Despite having numerous benefits, integrating ICT in school financial management has equally a sizeable number of challenges. These include but not limited to the following. There is high initial investment in ICT infrastructure and training. It is not easy to ensure data security and privacy. Overcoming digital divide and access issues prove to be a surmountable mountain. Also, developing digital literacy and capacity building for stakeholders cannot be looked down upon. Most importantly, managing change and potential resistance to new technology is one of the biggest cancers organizations face.

## **7. LITERATURE REVIEW**

The integration of Information Communication Technology in school financial management has become increasingly prominent in recent years. Driven by the potential for improved efficiency, transparency, and accountability, schools worldwide are exploring various ways to leverage technology to optimize their financial operations. This literature review examines existing research on this topic, highlighting key findings, relevant examples and potential challenges.

### **7.1. Key Findings**

The key findings generated through literature review included enhanced efficiency, improved transparency, better budgeting and forecasting, and reduced corruption and mismanagement ( ).

### **7.2. Enhance Efficiency**

ICT can automate routine tasks such as fee collection, payroll processing, and budgeting, freeing up staff time for more strategic activities (Park, et.al. 2023). According to Ghosh, et.al. (2022), ICT integration in school financial management poses significant time savings and reduces errors.

### **7.3. Improved Transparency**

Financial data can be easily accessed and analysed through ICT systems, leading to greater transparency and accountability (Chang, et.al. 2021). This fosters trust among stakeholders and facilitates informed decision-making (Mhlanga, et.al. 2024).

### **7.4. Better Budgeting and Forecasting**

According to Lee and Kim (2022), ICT tools enable detailed financial modelling and scenario planning, allowing schools to make more informed budgeting decisions and anticipate future financial needs.

### **7.5. Reduced Corruption and Mismanagement**

ICT systems can create audit trails and improve internal controls, minimizing the risk of fraud and mismanagement (Diallo, et.al. (2023: Ndongwe E`2024). According to Singh and Kumar (2024), integrating ICT in school financial management enhances the potential for increased accountability and reduced financial mismanagement through ICT tools.

### **7.6. Relevant Examples**

School Management Information Systems, Online Fee Payment System, and Cloud-based Accounting Software are the relevant ICT packages that can be used to improve ICT efficiency and applicability in school financial management.

## **8. RESEARCH METHODOLOGY**

Data for this paper was gathered through three major sources: document analysis, interviews and observations.

Interviews were the main methods used to collect data. Semi-structured interviews and interview guides were used to gather data from the participants in separate one-on-one interviews. Baker, et.al. (2023) avers that semi-structured interviews give room to probe thought-provoking clues and to pursue for further clarification. The intention was to capture comprehensive views of the respondents (Creswell, 2007) about their interpretations and understandings of the role the head teacher played in expediting ICT integration in financial management.

Observations and an observation check list were also employed to assemble data. According to Yin (2023), observations do not rely on what people say they do, or what they say they think. Instead, observations draw on the direct evidence of the eyes to witness events being done naturally (Robson, 2002). Observations were carried out on the definite ICT present to inaugurate and substantiate the types and kinds of ICT and software fitted in the computers, and to find out if and in what manner they supported financial management. This restructured the schools' status of ICT used for financial management. The head teachers and the finance managers were observed as they performed financial management responsibilities like posting payments and expenditure requisitions, cash book reconciliation and preparing both trial balances and financial statements to establish whether and how they integrated ICT in these processes. Observing the head teachers and the finance managers as they operated offered an opportunity to practically comprehend how they employed ICT in financial management, and how the ICT expedited the process.

Documentary evidence such as school budgets, schoolbooks of accounts, school development plans, school strategic plans, and monitoring and evaluation frameworks were analysed. The school budgets offered forecasts on the use of finances to acquire ICT, software and staff training to support integration of ICT in financial management.

Strategic and development plans were analysed to give bearing route for prioritization of the use of ICT to manage finances, while monitoring and evaluation frameworks recreated how the ICT integration procedure had been assessed to eradicate impediments in the use of ICT and hereafter enhance it. Other financial documents like payment receipts, payment vouchers, cashbook, trial balances, and income and expenditure accounts statements were analysed to illustrate whether the school had been incorporating ICT in managing finances. Bowen (2022) identified document analysis as a rich source of data. These documents recreated historical events, in so doing aiding to ascertain whether technological leadership for financial management had been part of the agenda in the school.

## **9. POPULATION AND SAMPLING**

The study's population was all the schools (both private and public) in Nyamakuyo cluster in Mudzi District, Mashonaland East Province, Zimbabwe. The schools were purposefully selected as the study's population due to their connectivity to the national electricity grid as well as internet connectivity.

## **10. SAMPLE**

The sample schools were purposively selected, aiming schools with a history of ICT integration in financial management. The participants targeted were staff involved in managing the schools' finances or maintaining the ICT technologies. To collect the data, it was imperative therefore, to interview the

five head teachers, five finance managers, five IT technicians, the five SDA/SDC chairpersons and the auditor to understand how ICT were integrated in managing the selected schools' finances.

**11. RESEARCH FINDINGS**

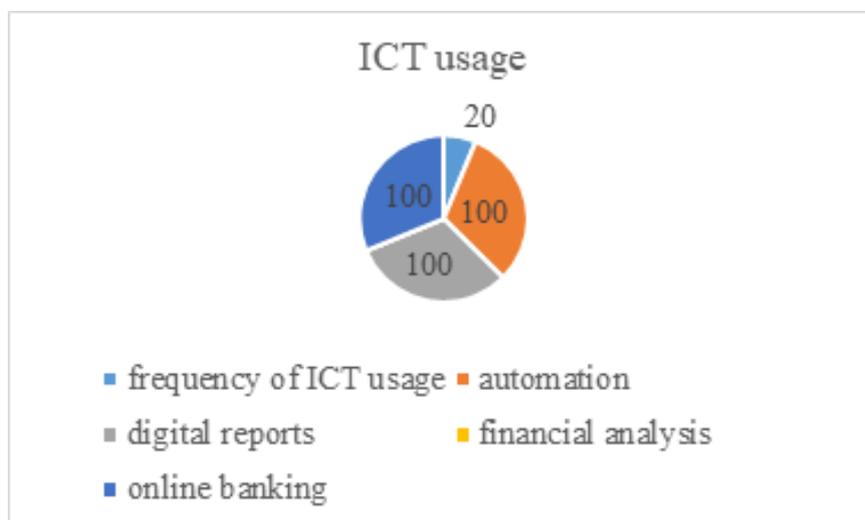
The interview questions were administered to five school heads in Nyamakuyo cluster and they all responded. All the five school heads in the cluster indicated that ICT integration in financial management is not fully embraced in their schools. The findings from the semi-structured interviews conducted on five school heads in the cluster revealed that school heads facilitate integration of ICT in school financial management. The table below indicates the role of the school heads in facilitating ICT integration in school financial management.

**Table 1**

<b>Role of school head in integrating ICT in school financial management</b>	<b>Number of schools implementing the role</b>	<b>Number of responses</b>	<b>Percentage of schools</b>
Mobilizing resources	5	5	100
Implementing ICT integration in financial management	0	5	0
Internet connection	5	5	100
Availing ICT personnel	4	5	80
Facilitating the in-service training in ICT usage to staff	4	5	80
Developing a clear vision for ICT integration in financial management	0	5	0
Budgeting for ICT infrastructure and training	5	5	100

From table 1 above, all the schools in Nyamakuyo cluster in Mudzi District mobilized resources to acquire ICT gadgets including desktops and laptops. This clearly indicates that all schools in Nyamakuyo cluster are resourced in computers and desktops. For a clear vision and implementation of ICT in school financial management, all school heads indicated lack of the two aspects in their schools. This justifies why all the schools are not yet fully integrating ICT in school financial management. From table 1 above, all the schools in Nyamakuyo cluster indicated that their schools are connected to the internet. For availing ICT personnel and facilitating in-service training, only one school recorded non-compliance.

The findings from observation checklist administered to 5 schools which were categorized into 5 research areas of frequency of ICT usage, extent of automation in financial processes, use of online banking and electronic payment systems, presence of digital financial reports and statements, and utilization of ICT for financial analysis and forecasting were as follows:



From the data presented on the pie-chart above, 20% of the schools showed that they frequently use ICT for financial data entry and record keeping. All the schools in Nyamakuyo cluster indicated automation in financial processes especially budgeting. However, no school from the cluster used ICT for payroll systems. All schools had digital financial reports and statements for the previous financial

year. They all, however, indicated that these reports and statements were further printed out into hardcopies for reporting on financial meetings. No school had signs of utilizing ICT for financial analysis and forecasting. All 5 schools in Nyamakuyo cluster revealed use of online banking and electronic payment systems. The discrepancies in levels of ICT integration in school financial management indicate differences in resource availability and leadership desire.

The findings from focus group questions administered to a mixed bag of stakeholders in Nyamakuyo cluster indicated that, there were various factors hindering ICT integration in school financial management. Lack of ICT skills among school administrators and support staff was the most deterrent barrier to ICT integration in financial management in schools in the cluster. This was followed by limited awareness of ICT benefits among stakeholders in Nyamakuyo cluster schools. Lack of clear ICT policies and guidelines resulting from insufficient regulatory framework for ICT integration led to limited stakeholder engagement and participation in integrating ICT in school financial management in Nyamakuyo cluster schools. Focus group questions further unpacked limited budgets for ICT infrastructure and maintenance creating the challenges of insufficient computer hardware and software in integrating ICT in school financial management. Limited budgets suffocated high costs of software and hardware upgrades, as well as insufficient funding for staff training and development. The same focus group questions revealed competing priorities for resource allocation as another barrier to ICT integration in school financial management as it requires installation of compatible and reliable software to ensure effectiveness. The cluster also faces the challenge of high staff turnover and brain drain which subsequently gives rise to shortage of knowledgeable personnel in ICT usage. Finally, results from focus group questions conducted in Nyamakuyo cluster schools revealed that resistance to change from traditional manual systems greatly impacted on ICT integration in school financial management.

## **12. CONCLUSION**

The research paper can conclude that ICT integration in school financial management is still very unpopular in some rural schools where there are lack of awareness and financial resources like Nyamakuyo cluster in Mudzi district. This can be evidenced by the research findings obtained from the interviews, observations, and focus group interviews conducted by the researchers. Lack of ICT skills among school administrators, limited awareness of ICT benefits, lack of clear ICT policies and guidelines, insufficient regulatory framework for ICT integration, limited stakeholder engagement and participation, as well as resistance to change from traditional manual systems among others deter ICT integration in school financial management.

## **13. RECOMMENDATIONS**

The research recommends that:

- The government to conduct a needs assessment to identify specific challenges hindering schools from integrating ICT in financial management.
- Schools to develop a comprehensive ICT integration plan in financial management.
- The government to provide training and capacity-building programs that encompass ICT integration in financial management matters.
- The government to provide platforms for schools to establish partnerships with ICT service providers in fostering ICT integration in school financial management.
- The government, responsible authorities, and schools to allocate sufficient budgets for ICT infrastructure and maintenance.
- The government, responsible authorities, and schools to develop clear policies and guidelines for ICT integration in school financial management.
- Schools to engage stakeholders and promote awareness of ICT benefits in school financial management.

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