Assessing the Performance of Primary School Information Management Systems (PReM) in Data Provision: A Focus on Two Selected Public Primary Schools at Temeke Municipal Council, Dar es Salaam, Tanzania

Linus J. Mmole[1]
Shima D. Banele[2]

[1]linus.mmole.jr@gmail.com
[2]shima.banele@cbe.ac.tz

[1]https://orcid.org/0009-0000-0682-2468
[2]https://orcid.org/0000-0003-2295-5572

[1,2]College of Business Education (CBE), Dar es Salaam, Tanzania

ABSTRACT

The study aimed to assess the performance of Primary School Information Management Systems (PReM) in data provision at Dar es Salaam city. Specifically, the study aimed to determine the school-based requirements to deploy PReM for students - data collection, examine the impacts of PReM utilization, and explore stakeholders feeling on the use of PReM in education aspects from Mtoni Kijichi and Bwawani Primary School at Temeke Municipality, This study was guided by Information Systems Theory and Data Quality Theory. The study adopted a cross-sectional design collecting quantitative data through surveys and questionnaires. Interview and documentary review were utilized to collect the qualitative data. The study adopted non-probability and purposive sampling techniques for selecting 399 respondents (School pupils, parents, academic teachers, Ward Executive Officers, and Examination Administration and Certification Directorate staff) from the total population within the study area. Descriptive statistics (frequency), thematic and multiple linear regression models were used for analysis. Research findings from specific objective one portray that hardware with high capability has been purchased, stakeholder involvement before launching any information management system is important, and the implementation of the system must comply with regulations and pilot conducting before full implementation. Moreover, on the impacts of PReM utilization towards accuracy data provision, multiple linear regression results divulge that the independent variables (reduced workload, time savings, improved monitoring, data-driven interventions, enhanced learning outcomes, data accuracy as well as security and privacy) lead the positive relationship with PReM performance. Furthermore, respondents had positive feelings concerning the use of PReM in education aspects. The study conclude that availability of adequate hardware (Computers, tablets, and servers), reliable internet connectivity, robust network infrastructure, and compatibility with existing school management systems are the main school-based requirements for PReM deployment in student data collection. The study recommended that National Examinations Council of Tanzania (NECTA) in collaboration with MoEST had to ensure improved PReM infrastructure and training programs for smooth integration and better school management and performance.

Keywords: Accuracy, Information Management Systems (IMS), Performance, Primary School

I. INTRODUCTION

Globally, Information Management Systems (IMIS) facilitates the management of various activities and procedures that are crucial for converting resources into goods and amenities to meet the organization's goals (Mezgebe et al., 2023). Worldwide, ministries of education collaboratively with different agencies are struggling to ensure the presence of better performances through IMIS deployment in schooling-related activities. Consequently, the IMS in education perspective is recommended for supporting the personalization of learning initiatives by tracking student progress, identifying areas for intervention, and tailoring instructional materials to meet individual needs (Rahayu et al., 2022). Ultimately, in improving educational outcomes, IMIS is recognized for playing crucial roles in promoting equity, student records management, tracking educational outcomes, providing the support of evidence-based information for policymaking, and fostering innovation in education systems (Gondwe, 2024; Huang et al., 2024).

Furthermore, the IMIS in basic education has been applicable in gathering, processing, and analyzing data for student achievement, attendance, and school performance (Mathende & Beach, 2022). Certainly, the countries are struggling to forefronting the adoption of IMIS to enhance financial management in schools. For instance, in Tanzania Facility Financial Accounting and Reporting System (FFARS) is deployed for schools' budgets, automation of received funds, disbursements, fund utilization at the same time generating the real-time feedback reports (Vasell & Nilsson, 2023). Also, in East Africa, the advancement of IMIS utilization is evidenced in Kenya Education Management

Information System (KEMIS) and Uganda Education Management Information System (UEMIS) being useful for acquisition of educational resources, track student progress, and personalize learning experiences, ultimately contributing to improve educational outcomes (Amuha & Masiero, 2022; Chege, 2022).

Additionally, Schuetze et al. (2023) commented that Tanzania IMIS has passed into different phases in handling school matters; recently, schools are executed into: Student management information systems (EMIS), Human Resources Management Systems (HCIMS), Facility Financial Accounting and Reporting System (FFARS), e-learning systems and platforms including shuledirect, e-library management systems (TieLibrary), Annual School Based Education Management Information Systems (BEMIS) for collection and manipulation of annual pre-schools, primary and secondary schools statistics, payroll systems, to mention but a few. Consequently, the National Examination Council of Tanzania in 2016 developed Primary School Information Management Systems (PReM) aiming at revolutionizating student data records management, efficiently promoting students from grade to grade, appropriately handling continuous assessments, electronic students transferring and mobilities, students selection after grade seven examination, updated real-time data accessibility for decision-making as well as fostering the personalize learning support based on students abilities (National Examinations Council of Tanzania [NECTA], 2023).

Nonetheless, PReM empowers educators to streamline operations and provide valuable insights that contribute to the overall quality of primary education (Mubofu, 2022). Moreover, Masegenya and Mwila (2023) disclosed that PReM operates through the collaborative efforts between NECTA and President's Office of Regional Administration, and the Local Government Authority (PO-RALG). Furthermore, PReM added value on the implementation and monitoring of policies towards enhancing the primary education quality in Tanzania. Also, the PReM works as centralized digital platforms and database systems that are comprised of student demographic information and grades across schools, wards, streets/villages, districts, and regions being efficiently managed as inputs for decision-making (Ibrahim et al., 2023). Subsequently, different initiatives including regular meetings, training programs, and capacity-building were conducted at all levels of education management organs to ensure practitioners are well equipped with PReM tools, resources, and procedures to effectively perform their roles (Manoharan & Rangarajan, 2022).

1.1 Statement of the Problem

Technology integration is seen as a way to improve institutional management quality by addressing challenges and shortcomings that lead to uncertainties in service satisfaction based on customer demand and the increasing demands of the operational environment (Cui, 2023). From an education perspective, the integration of technologies through IMS has brought significant improvements in data accuracy, information storage, and decision-making (Ragazou et al., 2023). However, countries are struggling to solve education challenges and experiences in different countries henceforth designing, developing, and deploying various digital and technology-based systems. Moreover, the possession of an accurate data-processed information system has been apprehended to be essential for informed decision-making, effective resource allocation, and evidence-based policy formulation in the education sector (Raihan, 2024).

The development and integration of the Information Management System for Primary Education Management (IMIS-PReM) in Tanzania was a revolutionary initiative to tackle the challenges of lacking centralized and efficient data management systems within the education sector (Mulokozi & Kitula, 2023). Prior to the establishment of IMIS-PReM, acquiring student information was difficult due to the scattering of manual records and databases. Scattering of manual records and databases led to inconsistencies, inaccuracies and delays in accessing critical data for decision-making (Masegenya & Mwila, 2023). Currently, in Tanzania there are 20,763 registered primary schools 2,607 being private and 18,156 public owned; whistly, there are 15,872,709 students distributed into 7,878,020 girls and 7,993,998 boys from grade one to seven that are registered through PReM (NECTA, 2023). Furthermore, all primary schools register students in grade one and promote them to the next level every year. According to Mtani and Mbelwa (2022), the need for a unified platform to streamline data management processes and improve information sharing among education management bodies led the government of Tanzania to develop IMIS-PReM.

Nonetheless, the previously fragmented traditional approaches have been replaced by PReM, a centralized data management system that is now efficient in fostering information sharing, enhancing decision-making processes, and improving the implementation and monitoring of quality education delivery. This system engaged users from the grassroots level. (Al-Attari & Essa, 2024). Certainly, effective school-based data is essential for planning, monitoring, evaluating, and overseeing education policies and programs. Consequently, PReM as robust database systems enables real-time access to critical data, including the electronically enrollment figures, academic performance, and demographic information for accuracy, transparency, and accountability within the education sector. Based on the mentioned grounds, NECTA came up with decisions to develop the PReM for effective implementation of educational outcomes, and provide evidence-based policies monitoring for educational quality and equity for the improvement of primary schools' country-wide (NECTA, 2023; Mulokonzi & Kitula, 2023). Subsequently, the current study assessed

the performance of Primary School Information Management Systems (PReM) in data provision in the selected schools at Dar es Salaam City.

1.2 Research Objectives

The main research objective was broken into three specific objectives. These were to: -

i. Determine the school-based requirements to deploy PReM for student data collection in the selected primary schools at Temeke Municipality.
ii. Examine the impacts of PReM utilization towards accurate data provision in the selected primary schools at Temeke Municipality.
iii. Explore stakeholders' feelings on the use of PReM in education aspects from the selected primary schools at Temeke Municipality.

1.3 Research Questions

The specific research objectives were attained through responding to the following research questions:

i. What are the school-based requirements for PReM deployment in student data collection in selected primary schools at Temeke Municipality?
ii. What are the impacts of PReM utilization towards accurate data provision in selected primary schools at Temeke Municipality?
iii. How do the stakeholders feel about the use of PReM in education aspects from the selected primary schools at Temeke Municipality?

II. LITERATURE REVIEW

This study was guided by two theories: Information Systems Theory (IST) and Data Quality Theory (DQT). These theories are essential for understanding the strategic roles of technology in facilitating communication, decision-making, innovation, and collaboration within primary schools. The following sections present these theories in detail.

2.1 Theoretical Review

2.1.1 Information Systems Theory (IST)

Information Systems Theory is a multidisciplinary framework examining the structure, functionality and impact of information systems within organizational contexts (Ågerfalk et al., 2022). The IST encompasses various perspectives such as technical, behavioral and managerial aspect useful for understanding the designing, implementation and utilization of the system to support organizational goals and objectives (Dwivedi et al., 2022). The theory interplayed the information systems as artifacts composed of deployment components including people, processes, technology, and data that are supposed to be aligned to enhance organizational performance and competitiveness (Al-Okaily, 2024). Also, the IST provides strategic insights into the roles of technologies in facilitating communication, decision-making, innovation, and collaboration within the organization's components regardless of broader societal implications (Wahyoedi et al., 2023). IST is selected to assist in assessing different PReM systems and function attributes for providing accurate data as inputs for better education management (Xia et al., 2022).

2.1.2 Data Quality Theory (DQT)

The Data Quality Theory (DQT) pertains to the systematic assessment and maintenance of data accuracy, reliability, completeness, and relevance within organizational contexts (Karkošková, 2023). According to the theory, data had been made to ensure that they meet the predefined quality standards that support effective decision-making processes for meeting entailed organizational objectives (Panagiotis et al., 2024). Also, Egbe (2022) show that the DQT encompasses dimensions of data quality, perspectives of accuracy, consistency, timeliness, and usability.

The researcher of the current study decided to engage the DQT since it encompasses elements to support the selected research methodologies and frameworks for evaluating and improving data quality through PReM throughout the primary education delivery lifecycle. Besides, the DQT helped to assess the revolutionizations brought by PReM in planning, examining, and maintaining data quality standards, and its impacts on decision-making processes for primary school delivery.

IST and DQT allow comprehensive approaches in assessing the attributes required for deploying the PReM system for school-based student data collection. Moreover, the combination of IST and DQT focused on ensuring that the PReM system is not only technologically robust but also enables capabilities for the collection of high-quality and accurate primary school data (Peter, 2023). The integration of these theories helped address the requirements for data handling, usage of user-friendly interfaces, and flexibilities in system design and upgrading, ensuring school-based data

are collected to fit the purpose, provide a reliable foundation for enhancing student services and communication (Sutar et al., 2024). IST and DQT provide a holistic framework for evaluating stakeholders' perceptions concerning PReM in primary schools.

Furthermore, this theory capacitates the researcher in creating a robust methodology for assessing multiple primary schools' stakeholders including academic teachers, WEOs, parents, and DEAC staff on perceiving the use of PReM in educational contexts (Kelly, 2023). Moreover, the integrated approach of IST and DQT allows a deeper understanding of the stakeholders' experiences, ensuring that feedback is accurately collected and analyzed to improve system functionality, user experience, and educational outcomes (Ansari et al., 2022). Also, capacitate in ensuring that the PReM supports data-driven decisions respectively to the needs and opinions of stakeholders (Anthony, 2022). IST and DQT integration allow detailed examination on how PReM influences educational outcomes, teacher-student relationships, and school management, with data quality serving as a key measure of system effectiveness (Shang & Sivaparthipan, 2022). Certainly, the assessment of PReM impacts is grounded in robust technological structures and accurate, meaningful data, leading to well-informed decisions (Fan & Geerts, 2022).

2.2 Empirical Review

2.2.1 School-based requirements to deploy EMIS

Ako (2022) commented that for effective implementation of EMIS, there must be the presence of a database for schools, desktop computers, laptops, strong internet, external hard drives, Surveillance Cameras, school email services, library software, and ICT technicians. Furthermore, Nwakesiri (2022) assessed the Development of the Web-Based Data-Driven University Information Management System (UIMS) for the Inter-University Council for West Africa and found that for UIMS to work well, the developed system must effectively protect data, appropriately integrate the university's academic life cycle, assets, finance, human resource information, process well the received data, produce and analyze the report based on the format developed in the system and enabled working with flexibilities and user-friendly manner.

Smith (2024), highlighted the importance of data security and stakeholder engagement for effective EMIS deployment in the USA. Nwakesiri (2022) argued that EMIS implementation and provision of the intended outputs had to be credible with timely data for policy-making and planning. According to Wamutoro et al. (2022) implementation of EMIS for student information management in different public secondary schools in Kenya was endlessly improvements. Mwombeki (2022) found that inadequate EMIS infrastructure and a lack of trained personnel are major barriers. Similarly, in Nigeria, Adeoye et al. (2023) conducted a qualitative study in 2023 and found that user-friendliness and continuous professional development are critical for successful EMIS implementation.

2.2.2 Impacts of PReM Utilization in Primary Schools

According to Egbe (2022) in Cameroon, the implementation of EMIS was found to possess a positive contribution to the effective undertaking of administrative matters in different schools. Also, Sumaryanti and Purwanto (2023) commented that the School-Based Management (SBM) system implemented for school quality brought development among the students and educators as school components focused on program improvement. Also, Sakr and Muhammed (2022) observed that MIS contributed to the productivity of staff from primary schools and the Ministry of Education in Kenya. Further, Asio et al. (2022) added that IMS are helpful to in line the work in the educational sector.

Ortiz et al. (2023) conducted a qualitative study and found that EMIS facilitated more effective communication between teachers and parents, thus improving student engagement. Another research by Wang and Aviles (2023) in rural China found that EMIS adoption led to better resource allocation and reduced dropout rates. Similarly, Ndiku et al. (2014) found that EMIS utilization enhanced data accuracy and decision-making capabilities among primary schools in Kenya. Also, PReM utilization has led to significant improvements in administrative efficiency and student performance tracking in Dodoma, Tanzania (Mussa, 2023).

2.2.3 Stakeholders' Feelings on the Information Systems for School Data Handling

Clipa et al. (2023) disclosed that there are positive scores in ICT integration in teaching practices in Romania. Ejimofor and Okonkwo (2022) revealed that the use of EMIS for curriculum and instruction, human resources, school-community relations, and finance are positively influencing secondary schools' management, reducing the time on routine tasks henceforth freeing up time for other school management engagements. According to Mathende and Beach (2022), the integration of ICT in Education perspectives depends on the availability of electricity possession of devices such as computers and adequate materials. Certainly, Wamutoro et al. (2022) assessed the influence of EMIS on Students in Public Secondary Schools in Kenya through applied mixed research methods from 1334 respondents revealed that EMIS is effective in ensuring communication among students and teachers for progress. According to Chimangeni-

Mserembo (2022), the perception of the Education Management Information System by rural head teachers and school teachers revealed and acknowledged the importance of EMIS including data accuracy, efficient reporting, and improved decision-making.

III. METHODOLOGY

This section presents the research design, intended population, sampling and sample size, data collection and analysis

3.1 Research Design

This study adopted a cross-sectional design by involving questionnaires, in-depth interviews, and a documentary review. Cross cross-sectional design approach has been chosen since it allows the collection of multiple data sources from different respondents to respond to the research objectives, also it is efficient and cost-effective, making it perfect for this study that aims to collect information when time or resources are inadequate. The study was conducted by selecting 399 respondents at Temeke municipal council in Dar es Salaam city by selecting Mtoni Kijichi and Bwawani Primary Schools.

3.2 Population and Sampling

3.2.1 Population

The study involved 388 pupils from Mtoni Kijichi and Bwawani primary schools. Moreover, 2 academic teachers, 2 Ward Executive Officers, 5 parents, and 2 Directorate Examination Adminstration and Certification staff were chosen because are amongst PReM stakeholders making 399 total respondents. All respondents were administered to all data collection tools to respond to each specific objective.

3.2.2 Sampling and Sample Size

The study adopted non-probability through purposive sampling techniques for selecting 399 respondents (School pupils, parents, academic teachers, Ward Executive Officers, and Examination Administration and Certification Directorate staff) from the total population within the study area. Pupils were exposed to the closed-ended questionnaire. The researcher decided to choose standards 5 to 7 to participate in the study as are capable of answering items in the questionnaire according to their understanding. Pupils, parents, academic teachers, WEO, and DEAC staff were selected to participate in this study, since, they are the main stakeholders of PReM.

3.3 Data Collection and Analysis

Quantitative and qualitative data was analyzed based on the data nature of data. Research questions were analyzed using descriptive statistics and thematic analysis, findings were presented by using table summaries and narrations. Further, data for research question two was analyzed by multiple linear regression model and presented by tables.

IV. FINDINGS & DISCUSSIONS

This section presents the results and discussions of this study.

4.1 Profiles of Respondents

Findings from Table 1 revealed that 388 (97.2%) respondents had 7 to 15 years, 7 (1.5%) aged 31 to 40 and few respondents 6 (1.3%) were aged 20 to 30. Also, Results from same Table reveal that more than half of the respondents 207 (51.9%) were male and the rest 192 (48.1%) were female. Further, it was showed that 388 (97.2%) respondents had primary, 8 (2%) had Bachelor's degree, 2 (0.5%) had secondary and 1 (0.3) had diploma education. Furthermore, results showed that the majority of respondents 390 (97.7%) were single and 9 (2.3) were married.

Table 1

Demographic Characteristics of Respondents (n=399)

Parameter		Frequency	Percent (%)
Age	7 – 15	388	97.2
	20 – 30	6	1.5
	31 – 40	7	1.3
	Total	**399**	**100.0**
Sex	Male	207	51.9
	Female	192	48.1
	Total	**399**	**100.0**
Education level	Primary education	388	97.2
	Secondary education	2	0.5
	Diploma	1	0.3
	Bachelor degree	8	2.0
	Total	**399**	**100.0**
Marital status	Single	390	97.7
	Married	9	2.3
	Total	**399**	**100.0**

4.2 School-Based Requirements to Deploy Primary School Information Management Systems (PReM) for Students-Data Collection

4.2.1 Technical Infrastructure Requirements

Respondents were asked to provide their views concerning school-based requirements to deploy PReM for students' data collection. Findings in Table 2 revealed that 297 (74.4%) commented that in different primary schools where PReM was utilized, there should be adequate hardware, such as computers, tablets, and servers. Indicated that devices such as desktop computers should be modern and capable of running PReM software efficiently. Moreover, it was observed that 59 (14.8%) respondents commented that there should have been network infrastructure. Hence, the findings indicated that reliable internet connectivity and robust network infrastructure are essential for the storage, and access of data. Primary schools needed to upgrade existing network equipment to handle the demands of PReM. Furthermore, 43 (10.8%) respondents opined that the PReM system needed to be incoperated with existing school management software so as to support integration with other educational tools and platforms. The findings related to the study done by Mathende and Beach (2022), whereas it was revealed that electricity, devices such as computers, and adequate materials are very important twards ICT utilization.

Subsequently, with the above data, one among the respondents commented that,

> "*Current computers are outdated for PReM utilization, School administration needed to purchase new machines with higher RAM and current edition".* (Academic teacher, June, 2024).

The statement indicated that the existing hardware was not capable of handling the advanced or intensive tasks required by PReM, whereas investing in more powerful computers was essential to meet demands and ensure the smooth and efficient operation of PReM.

Table 2

Technical Infrastructure Requirements (n=399)

Variables	N	Percent (%)
Hardware	297	74.4
Network Infrastructure	59	14.8
Software compatibility	43	10.8
Total	**399**	**100.0**

4.2.2 Data Security and Privacy Requirements

Findings showed that 299 (75%) respondents opined that PReM must comply with local, national, and international data protection regulations to ensure data encryption, secure access controls, and regular audits. Moreover, 100 (25%) respondents commented that, implementation of role-based access controls needed to be incooperated to ensure authorized staff could access sensitive student data within the school.

Table 3
Data Security and Privacy Requirements (n=399)

Variables	N	Percent (%)
Compliance with regulations	299	75.0
Data access controls	100	25.0
Total	**399**	**100.0**

4.2.3 Administrative, Training, and Policy Requirements

Administrative, Training, and Policy Requirements was important aspects for PReM deployment. Findings divulge that 132 (33.1%) respondents opined that engagement of all stakeholders, including academic teachers, parents, students, and District and regional leaders was important before PReM initiation and after.

Engaging stakeholders during the initial implementation of the PReM system was crucial for ensuring the system met the users' requirements. Also, Smith (2024) insisted that data security and stakeholder engagement are very important aspects for consideration for effective EMIS deployment Moreover, it was found that 100 (25.1%) of respondents commented that different staff who integrated with PReM needed inclusive training programs in order to be equipped with capable in system operation, data entry, data management, and troubleshooting. Respondents were asked about training requirements during the interview session and one respondent commented that,

> *"Teachers will need extensive training to get familiar with PReM. Not everyone is tech-savvy".* (Academic teacher, June, 2024).

Furthermore, 88 (22.1%) respondents opined that adequate budgeting for the initial setup and ongoing maintenance of the PReM system was important. Based on the findings, the meaning was provided that the budget needed to include costs related to hardware, software licenses, training, and technical support. Furthermore, 79 (19.7%) respondents being at primary schools delineated the need for exposing young pupils to technologies for data collection, storage, and usage. Subsequently, suggestions are made on technology policies agenda to address issues for data ownership, consent, and data sharing with third parties. Furthermore, it was disclosed by Damayanto et al. (2024) that training programmes with awareness campaigns on the benefits of MIS had to be conducted for effective adaptability and adoptability of new technology.

Table 4
Administrative, Training, and Policy Requirements (n=399)

Variables	N	Percent (%)
Policy development	79	19.7
Stakeholder involvement	132	33.1
Staff training	100	25.1
Budget allocation	88	22.1
Total	**399**	**100.0**

4.2.4 Pilot Testing and Feedback Mechanisms Requirements

Results from Table 5 showed that 390 (97.7%) of respondents commented that conducting pilot tests in a few primary schools before full-scale implementation of PReM was crucial, for identifying potential issues that need modification and feedback gathering on the accuracy of the system. Furthermore, 9 (2.3%) respondents opined that establishing mechanisms for continuous feedback from users was very important in facilitating ongoing improvements and updates to the system.

Table 5
Pilot Testing and Feedback Mechanisms Requirements (n=399)

Variables	N	Percent (%)
Pilot programs	390	97.7
Feedback loops	9	2.3
Total	**399**	**100.0**

4.2.5 Impacts of PReM Utilization Towards Accuracy Data Provision

Study examined impacts of PReM utilization towards accuracy data provision employing the Multiple linear regression model for analysis. Findings from Table 6 disclosed that the R2 =0.41, implied that 41% of the disparity in accuracy data provision was explained through the independent variables. Multiple linear regression results revealed that the independent variables included reduced workload, time savings, improved monitoring, data-driven

interventions, enhanced learning outcomes, data accuracy, and security and privacy were statistically significant at P > 0.05.

Regression model analysis is shown as follows;

$$PReMPerform_i = \alpha + \beta_1 Rworkload_i + \beta_2 Tsavings_i + \beta_3 Imonitoring_i + \beta_4 Dintervention_i + \beta_5 Elearningoutcome_i + \beta_6 Sprivacy_i + \varepsilon_i$$

Currents studies conducted in Romania concur with this study, whereas it was observed that there are positive scores in ICT integration in teaching practices (Clipa *et al.,* 2023). The utilization of EMIS for curriculum and instruction and school-community relations and finance are positively influencing secondary schools' management, reduced the time on routine tasks henceforth freeing up time for other school management engagements (Ejimofor & Okonkwo, 2022). In Bengaluru City the performance of B-Schools was positively influenced by MIS utilization (Shinkat *et al*,. 2022). In Kenya it was observed that effectiveness and performance had positive relationship with MIS (Muzuva & Mutuku, 2022).

Table 6

Impacts of PReM Utilization Towards Accuracy Data Provision

Variable	B	S. Error	Beta	T	Sig.	95% C.I for B	
						Lower	Upper
Reduced Workload	-.998	.429	-.679	-2.329	.020	-1.841	-0.155
Time Savings	.779	.150	.562	5.185	.000	0.484	1.075
Improved monitoring	.867	.327	.597	2.654	.008	0.225	1.509
Data-driven interventions	.779	.150	.562	5.185	.000	0.484	1.075
Enhanced learning outcomes	.437	.164	.312	2.665	.008	0.115	0.760
Security and privacy	-.823	.305	-.546	-2.703	.007	-1.422	-0.225

R Square= 41%, Significant at P > 0.05, Not Significant at P < 0.05

4.3 Stakeholders Feeling on the Use of Primary School Information Management Systems in Education Aspects

4.3.1 Impact on Educational Management

Respondents were asked to share their feelings, and the findings revealed that 390 (97.7%) felt that PReM had improved efficiency in educational aspects, as shown in Table 7. Additionally, 9 (2.3%) believed that the utilization of PReM has led to enhanced data accuracy in primary schools as in Table 7. Teachers were asked about their feelings on the use of Primary School Information Management Systems in education aspects, one respondent said,

> *"PReM could streamline the data management process and give Primary School Teachers more time to focus on teaching". (*Academic Teacher, June, 2024).

Teachers saw potential benefits of PReM in terms of streamlined data management and improved teaching strategies, concerned with additional workload and data privacy. Another respondent insisted,

> *"As long as PReM does not add extra work for pupils, I think it's a good idea to use PReM in education aspects".* (Pupil, June, 2024).

These findings are not far from the study done by Mwombeki (2022), whereas its was observed that EMIS managed to capacitate primary and secondary schools to collect and evaluate student performance and pinpoint the problematic areas. Ali et al. (2021) commented that EMIS was capable of enhancing organizational performance in secondary schools. Also, Egbe (2022) argued that the implementation of EMIS had a positive contribution towards the implementation of administrative workload in different schools.

Table 7

Impact on Educational Management (n=399)

Variables	N	Percent (%)
Improved efficiency	390	97.7
Enhanced data accuracy	9	2.3
Total	**399**	**100.0**

4.3.2 Communication and Collaboration

Findings on PReM utilization led to the improvement of communication at 385 (96.4%) as indicated in Table 8. Furthermore, respondents opined that PReM encouraged better collaboration within the school was 15 (3.6%), as PReM provided a centralized repository for sharing student information and educational resources. Relatively to the

findings, the PReM facilitated effective and timely communication with parents, promoting a collaborative approach to students on education matters and assisting in on-hand information accessibility for prompt addressing. The EMIS has the potential to serve as a reliable platform for publicizing important information and updates. Likewise, Wamutoro et al., (2022) found that EMIS was effective in ensuring communication to students and teachers. In addition, the recommendation has been made that the MIS supports and increases communication between schools, pupils, and parents through a student portal that provides a platform for quick and efficient information exchange. Parents accessed different information regarding pupil's attendance, progress, and other schools information (Bustani et al., 2022; Wang & Aviles, 2023). Meanwhile, it was commented by Gopinathan et al. (2022) that collaborative EMIS supports enabled students to actively engage and participate. Nonetheless, Jurs et al. (2023), posited that EMIS improved communication and collaboration among administrators and administrative staff inter and intra-schools.

Table 8

Communication and Collaboration (n=399)

Variables	N	Percent (%)
Increased collaboration	15	3.6
Enhanced communication	385	96.4
Total	**399**	**100.0**

4.3.3 User Training and Support

Findings on user training and support showed that 298 (74.6%) of respondents commented that training sessions were crucial in ensuring that users maximize the benefits of PReM. Moreover, findings showed that continuous technical support was a key factor in maintaining positive stakeholder perceptions 101 (25.3%). Damayanto et al. (2024) observed that user training was very important for maintaining the integrity and privacy of institutional data. Also, Muzuva and Mutuku (2022) opined that MIS user was very crucial, since, MIS ensured that teachers, administrators, and IT staff were proficient in utilizing the system's features, that are directly impacting data accuracy and system effectiveness. Proper training equipped users with the skills are needed for accurate data entry, management, and analysis, thereby enhancing decision-making and operational efficiency (Ragazou et al., 2023; Ogunode et al., 2023).

Table 9

User Training and Support (n=399)

Variables	N	Percent (%)
Adequate training	298	74.6
Ongoing support	101	25.3
Total	**399**	**100.0**

4.3.4 Challenges and Areas for Improvement

Results showed that 251 (62.9%) respondents commented that during PReM utilization there were technical issues. Certainly, the findings proved that some stakeholders experienced technical difficulties, such as system downtimes or slow performance as hindrances to the effective use of PReM in education aspects. Moreover, the system that was customizable to fit better based on the specific schools' needs was found to be 148 (37.1%). Subsequently, users possessed the desire for additional features and functionalities to allow login details for parents towards the pupils. Also, it was found from the respondent by posing that,

"Sometimes the system is slow and crashes frequently". (Academic Teacher, June, 2024).

Teachers appreciated the organization and accessibility of student records but are frustrated by system reliability issues as was mentioned by one of the respondents that,

"PReM has potential, but the implementation needs more support and resources to be fully effective". (IT Technician, June, 2024)

The findings recognized the potential benefits of PReM but emphasized that successful implementation required additional support and resources, including better infrastructure, more training, and technical support for the full realization of the system's capabilities. The implementation of IMS was restricted by cost challenges and inadequate budgets for some institutions towards supporting the initial stage and ongoing active costs of IMS (Damayanto et al., 2024). Implementation of EMIS in primary schools was restricted by challenges like shortage of ICT technicians, inadequate internet connectivity, limited budget, frequent electricity outages, and absence of user-friendly software (Mussa, 2023).

Table 10

Challenges and Areas for Improvement (n=399)

Variables	N	Percent (%)
Technical issues	251	62.9
Customization and flexibility	148	37.1
Total	**399**	**100.0**

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

Results from specific objective one reveal that, primary schools need to ensure the availability of adequate hardware, such as computers, tablets, and servers. Also, reliable internet connectivity and robust network infrastructure are essential for data collection, storage, and access. PReM system must be compatible with existing school management software and should support integration with other educational tools and platforms. PReM must comply with local, national, and international data protection regulations so as to ensure data encryption, secure access controls, and regular audits. Further, respondents said that there should be implementation of role-based access controls to ensure that only authorized personnel can access sensitive student data within the school. Primary schools need to develop and implement policies regarding data collection, storage, and usage. Moreover, respondents said that there should be adequate budgeting together with conduction of pilot tests in a few primary schools before full-scale implementation. Also, there should be friendly mechanisms for continuous feedback from users so as to facilitate ongoing improvements and updates to the system.

Findings from specific objective two indicate that the independent variables included in the model were good predictors of accurate data provision. Results further indicate that independent variables included in the model collectively had a significant influence on accurate data provision.

Findings from specific objective three show that different stakeholders including pupils, parents, local leaders, administrators and teachers had positive feelings upon PReM uses in education aspects.

5.2 Recommendations

The study advised regular updates and upkeep of the system to avoid mistakes in data and make collecting and handling data more effective. By addressing these real-world issues, schools managed student information better, which led to improved planning, tracking, and report creation.

Policy recommendations were primarily directed toward the Ministry of Education, Science and Technology (MoEST) and policymakers. It was recommended that a standardized context be developed to guide the deployment and utilization of PReM within all primary schools to ensure consistency in data management across the country. Moreover, policies were suggested to support the provision of necessary PReM infrastructure and ongoing training programs for school personnel. These policies emphasized the need for regular system assessments to ensure that PReM continued to meet the evolving needs of primary schools. By setting these guidelines and ensuring proper oversight, the MoEST, in collaboration with NECTA, could help ensure that all schools benefited from improved data accuracy, which in turn enhanced decision-making at primary schools.

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