The Effectiveness of head teachers' use of education information management systems and data management in Tanzania's primary schools

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Abstract

The study examined the effectiveness of head teachers' use of Education Information Management System (EIMS) and data management in Tanzania's primary schools. The study was conducted in fifteen primary school in Wanging'ombe District, one of the districts in Southern highlands in Tanzania. The study employed a qualitative study approach to gain Head teacher's insights on their effective use of education management systems to manage education data in schools. Fifteen (15) head teachers were purposively identified as unit of case study analysis and were interviewed. Documentary review method was conducted to learn about quality of data in schools as result of head teachers use of education management systems. Data was analyzed thematically and data saturation point guided decision on the theme that emerged during the analysis. The results revealed that, head teacher's competence in the use of the system determined quality of school data and compliance to the standard of school data. Quality of data was jeopardized by headteacher's inability in the use of the education management systems. It was concluded that, head teachers in schools lack technical skills that hinder having expected quality educational data on time. It is therefore, recommended that, for effective head teachers' use of systems, there is a need for regular in-service training programmes to head teachers in schools.

Keywords: Head teachers, Education, Data management, online systems.

Introduction

Previous descriptions on the use of Education Management Information System (EIMS) in education has indicated that EIMS has become a critical component of everyday school data management practices since the 1990s in Europe (United Nations Children's Fund [UNICEF], 2023). EIMS has basically been used for storing students' records and managing school administrative tasks. Furthermore, in educational practices, these systems were not widely integrated across regions or countries educational data (Mimbi & Bankole, 2016). The adoption of EIMS grew rapidly in the 2000s as digital transformation spread across public sectors in educational institutions. This was due to a need for a centralized data management for improving accountability, policy-making, and educational outcomes (UNICEF, 2023). With advancements technology facilitated by internet access to users, EIMS has been in the form of platforms and are sophisticated and capable of handling large datasets in schools such as students' performance, staff profiles, and resource management (Ahmed, Bhuiyan & Helal, 2021).

In employing the EIMS platforms, it is reported by researchers that there are platforms that are reported by users to be more complex than others, with a sheer learning curve and hence failing to produce expected results to users (Ugwude & Ugwude, 2020). In such cases, managing data through traditional way such as paper-based methods prevailed in educational institutions (Ahmed et al., 2021). By the mid-2000s to 2010s, some European countries had implemented national or regional EIMS platforms to support data-driven decision-making at various educational levels but results did not yield expected results in decision making process as expected (UNICEF, 2023). Moreover, the Scandinavian countries adopted EIMS platforms to monitor educational outcomes and ensure equitable resource distribution, while the Eastern European countries adopted EIMS to strengthen data infrastructure (UNICEF, 2023). Installation of these EIMS systems did not improve efficiency in school management, data accuracy, and support data-driven decision-making process across the education sector (Kirui et al., 2022).

In Africa, the adoption and use of EIMS has accompanied with challenges such as users' knowledge and skills and use of the systems resulting to inefficiency in the use of the systems. The descriptive study by Muyesu (2016) in Kenya revealed that, although strategic and economic factors explained 48.3% and 43.9% respectively of the expected change in management of data, users had very little capacity to implement EIMS in schools. This led to school data being unproperly managed in education institutions. The Tanzanian government efforts to manage data electronically, is not only in the education sector. There have been efforts to employ the use of

electronic information system in all public sectors, however, the challenges have been users' capability to manage data in electronic formats (Newa & Mwantinwa, 2019).

Management of educational data in Tanzania has faced a number of challenges leading to unexpected results. For example, Nkata (2020) assessed the use of EIMS for administering academic activities in schools. The results revealed that, 98.3 % of schools use manual systems and about 1.7% of schools use both manual and Microsoft office application programmes. About 23.7 % of the users reported that, the use of digitalized systems such as EIMS was not used by users due to financial costs. Lack ICT infrastructures and computer literacy for supporting the implementation of the digital EIMS accounted about 21% of the expected users. Lack of training is revealed to be the influence of EIMS use as some users are reported to have insufficient orientation, support and training on the use of EIMS, (Ugwude & Ugwude, 2020). There have been efforts to address users' challenges to the use of EIMS in educational institutions by supply of devices and on job training but users' effectiveness such as the head of school is still raising a debate.

The theoretical stance

The task technology fit theory was adapted to measure key participants' capability in the use of the system. The theory assumes that, technology is likely to have expected positive impact depending on user's capability (Goodhue &Thompson, 1995). Since, the system was validated by the government for use, the researchers measured user's capability and production timelines as two key aspects in line with the study objectives. Other elements of the theory: quality, reliability, floatability, authorization, compatibility, and relationship with users were not measured. To address theoretical literature review gap, the technology acceptance theory by Davis (1989) was also adapted with assumption that for successful use of information system, users must accept using a system with aim of reducing their manual and personal effort when manipulating information. Therefore, the task technology fit theory was adapted with an attempt to measure key participants' capability in the use of the system. The technology acceptance theory was used to inform the study on users' acceptance of the system. With three elements: users' capability, production of data, and acceptance of the system, this adaption aided the study in attempt to understand how effective are head teachers when employing EIMS to manage educational data in schools?

Methodology

This study was conducted in in Wanging'ombe District, one of the administrative districts in Njombe region, Tanzania. Njombe region was purposively chosen among the political administration regions in Tanzania that bear similar nature when it comes to issues of education provision and administration of resources in such a highly centralized education system. In such a system, supply of educational resources such as digital platform is done by the government on equal bases. With this knowledge, Njombe region with four (4) districts were chosen. The districts are: Njombe, Wanging'ombe, Makete and Ludewa. To facilitate institutional, political administration and provision of social services, Njombe district has been divided into two administrative councils which are Njombe town council and Njombe rural. In terms of pupils' population at primary school level, Wanging'ombe and Ludewa leads with 114 primary schools each and is followed with Makete and Njombe town with 107 and 84 primary schools respectively. Makambako and Njombe rural has the least number of primary schools whereby the number of schools are 56 and 55 respectively (PORALG, 2023).

This qualitative study employed a case study design to understand headteachers' management and use EIMS to manage education data in schools in Wanging'ombe districts. The district was purposively selected due to its number of primary schools and being one of districts with schools in the rural area. Since EIMS data about schools are used by government authorities for official use, the research protocols such as getting permission to specified government authorities so as to get access to documentary data was observed. The researchers used the permission for the main purpose and nothing else. The key participants were assured of confidentiality and a combination of English alphabetic letters and numbers is used instead of the actual identities of the informants.

The study employed semi structured interview and documentary review methods to collect data from twenty (20) head teachers who were regarded as data analysis units based on a view that, they practiced management of educational data using the EIMS in their schools. The use of semi-structured interview method allowed the researchers to probe for more details when the key informant were ready to offer more information with respect to the study objectives. These key informants were purposively selected from the schools and during data collection process data saturation point determined this sample size. In this qualitative study, data were analyzed thematically whereby data from interview was transcribed verbatim to retain the meaning while

data from documentary review method was documented in special notebook, summarized and stored for future references. Thematic analysis procedure was employed and it begun with familiarization with the data by reading through the data with the aim of capturing clear meaning of the data. This was followed with coding to aid organization of data. After the step, interpreting data, organizing data and search for themes with regard to objectives of the study followed. The organization of data into themes was followed by reviewing the themes so as to see how the emerged themes are supported by data. The final step was to refine the themes in a way that writing up for reporting purposes followed. This process helped the researchers to interpret data both at manifest and interpretive level (Dawson, 2007). After this final step for each case study unit of analysis, a comparative analysis was done to orgnize similarities and differences of themes in each unit of analysis. Data saturation allowed for documentation of the unique themes that helpled interpretation and documentation of the findings.

Results and Discussions

Head teachers' capability in the use of EIMS system

The findings about head teachers' capability in the use of EIMS revealed that, although heads of schools were expected by their authorities such as the Ward Education Officers (WEOs), District Statistical and Logistical Officer (DSLO), District Primary Education Officer (DPEO) to use the system and efficiently play their roles by ensuring compliance with local and national education standards and/or guidelines, the head teachers more often played a role of approving the uploaded data by their subordinates in the platform than processing and managing data. The reasons for such phenomenon were a requirement by their higher authorities and their capabilities of performing the duties. This is confirmed by one of the head teachers who had these to report:

> The EIMS forms are in two formats. I receive the EIMS form in soft and hard copies. Data required by each of the two forms are filled in by our school statistician. This is clearly stipulated by the EIMS guidelines. My only role is to approve the recorded data and send them to other authorities. I check for matching between data in hard copy and the data in the system. I sometimes

> seek for assistance from the statisticians when I fail to understand data and interpret the information. Approving is not very hard if you can understand what is required in the hard copy (interview, HT2).

Data from this study also revealed that, the participant head teachers faced challenges related to information technology knowledge and skills. The head teachers worried about their knowledge and confidence on what they approved and uploaded in EIMS as pointed by one of the head teachers:

> Yes, I work with school data and sometimes information is promptly needed. So, what I do is to ask for experts. They can be my teachers or somebody else with skills in ICT anywhere around the school. You can't avoid because data are needed. I do succeed and meet deadlines. This can be avoided by having a system that is user friendly and with people who can manage the system independently. I think not all users are able to enter data as required by the system. EIMS is challenging when you are not very good in IT skills. You need to pay time otherwise you hire somebody, no matter what but need to accomplish requirements by authorities. I think training is required. I expect to learn day by day … (interview, HT12).

The need for knowledge or training on the system by headteachers suggested that, head teachers' capability in the use of the system and management of data required extra help in the area of skills and knowledge on the use. This result implies that despite the headteachers' recognition and use of the system; the participants were not very competent on the use of the system. It has been reported by Newa and Mwantimwa (2019) that despite the positive perception on the system in Tanzania, staff competence in the use of systems discourage effort to make use of electronic systems to record data in public sectors. This finding has implications to efforts by both users and data management supervisors that there is still to be improved to strengthen users' data management in the government educational sectors.

Head teachers' use of EIMS to process and produce data

Data from this study revealed that, the head teachers' use of EIMS helped the participants' head teachers to minimize manual work and reduced human errors that were common when they were

using paper work. The head teachers reiterated that, the improvement of data accuracy was a result of an automated systems as revealed by some of the head teachers:

> I think, EIMS often includes features that automate data and production. Thus, when entering data, EIMS reduce making errors. For example, you directly enter students' enrollment, attendance, grades, and other records directly. They are converted automatically in the required formats. The issue may be there when you make error and time is not available for amendments (interview, HT5).

> The significance advantage however outweighs the challenges. I am sure of reliable data even when I cannot calculate by myself. It is the system that is making errors in case of any. The system put data in standardized formats and ensure consistent of data. EIMS helps me to retrieval records when needed. For example, pupils' attendance and performance. Usually, the available EIMS data are organized in the same formats and can be accessible at any time (interview, HT7).

This narration implies that, the participants head teachers accepted the use of EIMS due to being sure of accuracy data and that they were not responsible for errors. It also implied that, since the participant were not ready to be responsible for errors, there is still to be done to help them recognize that, EIMS is a software that in any case cannot be responsible for use. The findings have implication to headteachers understanding of their roles as data mangers and leadership responsibilities within schools. In this aspect, Albiladi, et. al. (2020) has recommended for leadership approaches in professional training specifically to management of electronic data that can support the uniqueness of their leadership positions. The headteachers' preparation and supports are likely to facilitate effective production of electronic data, use and enhance their performance as leaders. There is still a need for continue of creation of self-awareness and knowledge of its functionality so as to facilitate ownership of EIMS generated outcomes. The head teachers should not only perform a role of approving records, send to authorities without having a strong understanding of what it means to have electronic data in the systems.

Head teachers' acceptance and use of EIMS

Data in this study revealed that, the participant head teachers accepted that the use of EIMS was effective as it aided making decisions on various educational matters. The headteachers informed the study that, EIMS improved school records as it made it easy to estimate pupils' attendance and ratios. This then helped head teachers to plan and manage school resources. This is confirmed by the head teachers' narrations:

> Data generated through EIMS has helped I and my colleagues to distribute educational resources such as teachers, teaching and learning materials on equal basis and timely. It is now easy and efficiently to make order from the supervisors because they can track data and be sure of the number of pupils and what is required. Data related to attendance are used to project teacher-pupils' ratios, pupils -textbooks ratios and the like. the ratio of pupils' vs teachers, among others. Looking back, I consider this to be a significant improvement when I compare with the previous practices (interview, HT9).

Data in this study revealed that, apart from projecting school educational outcomes, the system was used in monitoring workers planning for their performance, attendance and compliance to acceptable performance standards.

> I am now able to monitor the teachers' and school performance trends over time. I use it to know where we are and where we were in the past five years. For instance, I know the increase of the number of pupils through the use EIMS. I use EIMS to track staff attendance, absenteeism and leave requests. The automated attendance tracking and approval workflows for leave requests streamline the process and ensure accurate records. This helps us to report administration matters precisely (interview, H8).

This quotation is interpreted that, the participant head teachers accepted the system and they found it effective in the management of school data. It is therefore affirmed that the users' acceptance the EIMS was a result of data production and was enhanced by head teachers' satisfaction for its installment and use in schools. Usability and ease of use has been reported by researchers in the discipline of system management that it is an important factor on users'

attitude and satisfaction (Saad &Daud,2020). The finding in this study have added that users find its effectiveness after have accepted and measured utility in the system.

Conclusions and recommendations

Based on the study findings, it is concluded that, despite the participant head teachers' acceptance and use of EIMS, these users have significant challenges related to knowledge and skills in information technology that hinders their effective use and production of data. The generated data by EIMS are of higher percent accurate however, the participant teachers are not always confident as they are unable to justify the productions process. The generation of accurate data as a result of automation of the system aids obtaining accuracy data and reporting in an acceptable format for public use. Although skills and knowledge are key for effective performance of the system, acceptance of the system by users is a key factor for effectiveness use of an education Information management system.

To address challenges in the use of EIMS by head teachers in Tanzanian schools, the focus should be on the head teachers' knowledge and skills in information technology. Training should focus on the integration on theory and practicality of the use of the system. To strengthen the production of accurate data, head teachers should be trained in the aspects of monitoring of the system.

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