



Head Teachers' Preparedness to Use ICT in Management of Primary Schools in Ndihiwa Sub-County, Kenya

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Abstract

The use of Information and Communication Technology (ICT) has revolutionized every feature of human life including the education sector. Efforts to use ICT in both teaching and school management, for example, are growing in various countries. This study thus purposed to investigate head teachers' preparedness to use ICT in School Management Tasks (SMTs) in Ndihiwa sub-county, Homabay County in Kenya. The study employed a descriptive survey design in selected 46 primary schools. A total of 46 Head Teachers (HTs) and 6 Curriculum Support Officers (CSOs) were involved in the study. Questionnaires and interview guide were used to collect data. Quantitative data was analysed descriptively into frequencies and percentages whereas qualitative data was subjected to thematic analysis in line with the conceptual framework and the research questions. The two data sets were then triangulated for compelling and interesting results. Results show that although 87% of the HTs had received ICT training through self-sponsorship, their level of preparedness to use ICT in SMTs remains low. Results, for example, show that the HT's ICT proficiency was limited to basic use of the e-mail, internet and MS office respectively. Furthermore, results reveal that the HT's overall use of computer programs in performing SMTs was generally low at 31% with the leading use being for performing administrative tasks (45.1%), instructional tasks (27.5%) and financial tasks (20.7%) respectively. With the above findings, the study recommends further studies to identify the specific HT's ICT training needs meant to inform ICT Continuous Professional Development (CPD) training to equip the HTs with advanced computer proficiency skills.

Keywords: *Head Teachers' Preparedness, Information and Communication Technology (ICT), Management Tasks.*

INTRODUCTION

The growing use of Information and Communication Technology (ICT) has revolutionized every feature of human life. Education sector is no exception as efforts to use ICT in both teaching and School Management Tasks (SMTs) is growing in various countries including Kenya. Miraz et al. (2016), for example, argue that use of ICT is needed more than ever to aid various tasks if educational development is to be achieved. Consequently, numerous studies and efforts to use ICT in teaching and school management are now evident in many countries and continents. Examples of studies of studies of this nature are evident in Asia, Europe and America (Tay *et al.*, 2017; Tulowitzki *et al.*, 2022), Australia and Europe (Gerick *at al.*, 2017; Tulowitzki *eta al.*, 2022) and Africa (Oyedemi, 2015; Mwadulo & Odoyo, 2020; Oluoch,



2016; Omoso & Odindo, 2020). In Kenya, there have also been numerous government efforts to enhance use of ICT for teaching and management of schools (MoE, 2006; Mwadulo & Odoyo, 2020). Despite such efforts, little is known on the level of preparedness of teachers from various parts of the country to use ICT in schools. This study bridges this gap by investigating teachers' preparedness to use ICT in management of Primary schools of Ndhiwa sub-county in Kenya.

Over the years, usage of ICT in education has been embraced in various countries to improve the quality of learning and management of schools. The attempt to embrace ICT use in schools in many countries had, however, focused more on enactment of ICT enabler policies, provision of ICT infrastructure and resources. For instance in Asia, the Malaysian government has strived to provide internet access to all schools with little effort to improve teacher capacity for integrating ICT in teaching and learning processes in the country (Katitia *et al.*, 2019). Similarly in Africa, the effort to use ICT in schools is growing. For example, whereas in Egypt there is a requirement for teachers to possess an International Computer Driving License (ICDL) to be able to implement and use ICT resources in running of the schools, in Rwanda the government developed a master plan for transforming the Country's economy through implementing SMART classroom initiative by the year 2019 (UNESCO, 2019). According to UNESCO (2019) fifty percent (50%) of the schools in Rwanda had ICT devices and many teachers had received some ICT training by the end of 2019.

When used in the management of schools, ICT can positively impact school administration (Kipchumba, 2021). Juma, Raihan and Clement (2016) for instance asserts that the use of an efficient Education Management Information System (EMIS) can go a long way in helping achieve national and international educational goals through provision of accessible educational data and information. This perhaps might explain why resources have been committed in educational reforms across the globe to incorporate ICT in educational systems as a necessity for economic and social development (Katitia *et al.*, 2019; Omoso & Odindo, 2020). Consequently, revenue allocation for ICT usage in education for teaching and management is expected to increase in order to keep pace with technological changes being witnessed (Hero, 2020).

In Kenya, efforts to use ICT in management of schools are evident (MoE, 2006; Mwadulo & Odoyo, 2020; Oluoch, 2016). To support this effort, the government of Kenya enacted the National ICT Policy in the year 2006 to guide ICT education in Kenya (MoE, 2006). This National ICT policy is based on four guiding principles including infrastructure development, human resource development, stakeholder participation and appropriate policy and regulatory framework. Guided by this policy the Government of Kenya has put in efforts to provide computers, construct computer laboratories, train teachers in some schools in addition to mobilizing support from development partners (MoE, 2006). Efforts are also being made to improve usage of ICT in the day-to-day running of the schools such as the use of National Education Management Information System (NEMIS) to manage students' data and inform government funding for public schools. Despite such efforts, little is known on the level of preparedness of teachers from various parts of Kenya to use ICT in management of their schools. This study bridges this gap by investigating Head Teachers (HTs) preparedness to use ICT in management of Primary schools of Ndhiwa Sub-County in Kenya. To achieve this aim, the study posed one specific research question: How prepared are teachers to use ICT in



their school management tasks? The study findings might be used by practitioners, policy makers and researchers in various ways. For example, while practitioners such as HTs might use it to learn some better ICT management practices to adopt in their schools, researchers and policy makers might use it to identify gaps for further study and areas for interventions on the topic.

LITERATURE REVIEW

The preparedness of HTs to use ICT in their practices world over is often dictated by three main factors. These are training, availability of resources and support provided to teachers (Gerrick *et al.* 2017; Madulo & Odooyo, 2020; Omoso & Odindo, 2020). Wu *et al.* (2022) studied the effects of teacher- and school-level ICT training on teachers' use of digital educational resources in rural schools in China and argued that school managers should organize more ICT training, and encourage teachers to participate in ICT training as much as possible. Silva (2022) in contrary researched on ICT development and training for teachers in the western province of Srilanka and found that Teachers who had undergone ICT training and development were better equipped and confident to face the technologically advancing education system. A study by Isleta (2019) in Nigeria reported that the level of the computer proficiency of teachers was higher in computers program like Microsoft Word, Microsoft Excel, Microsoft power point, and internet Explorer. Such computer programs can also be used to perform the three SMTs (administrative, financial and instructional).

Studies show that teachers can use ICT to perform administrative SMTs such as maintaining discipline records, processing teacher leave and sick leave as well as keeping inventory records (Barasa, 2021). Also, ICT can be used not only to perform financial SMTs such as preparing and keeping records of supplies, workers' pay roll, assets inventory and levies collections but also for performing instructional SMTs such as making and keeping teachers' professional documents like schemes of work (Asik *et al.*, 2020; Omoso & Odindo, (2020; Ukanwa & Chiemeka, 2021). This implies that ICT can be used to perform a wide variety of administrative SMTs.

Kimani, Njati and Omae (2022) studied the administrative use of ICT in management of secondary schools in Kenya and established that there was inadequate awareness by principals on the need for use of ICT in management. In another study by Kimosop and Chemwei (2016) on the Frequency of Use of ICT among Secondary School Heads and Teachers in Nandi and Uasin Gishu Counties, Kenya; the findings were that ICT in schools were mostly used as gadgets for typing and producing exam materials. This findings suggest a low-level of ICT use in performing SMTs in Kenyan secondary schools.

When integrated in the management of schools to perform administrative, financial and instructional tasks, ICT can positively impact school administration (Kipchumba, 2021). The use of an efficient Education Management Information System (EMIS) goes a long way in helping achieve national and international educational goals through provision of accessible educational data and information (Juma, Raihan & Clement, 2016). Consequently, revenue allocation for ICT integration in education for teaching and management is expected to increase in order to keep pace with technological changes being witnessed (Hero, 2020). According to Hafifah (2020), the integration of ICT in SMTs has become an international

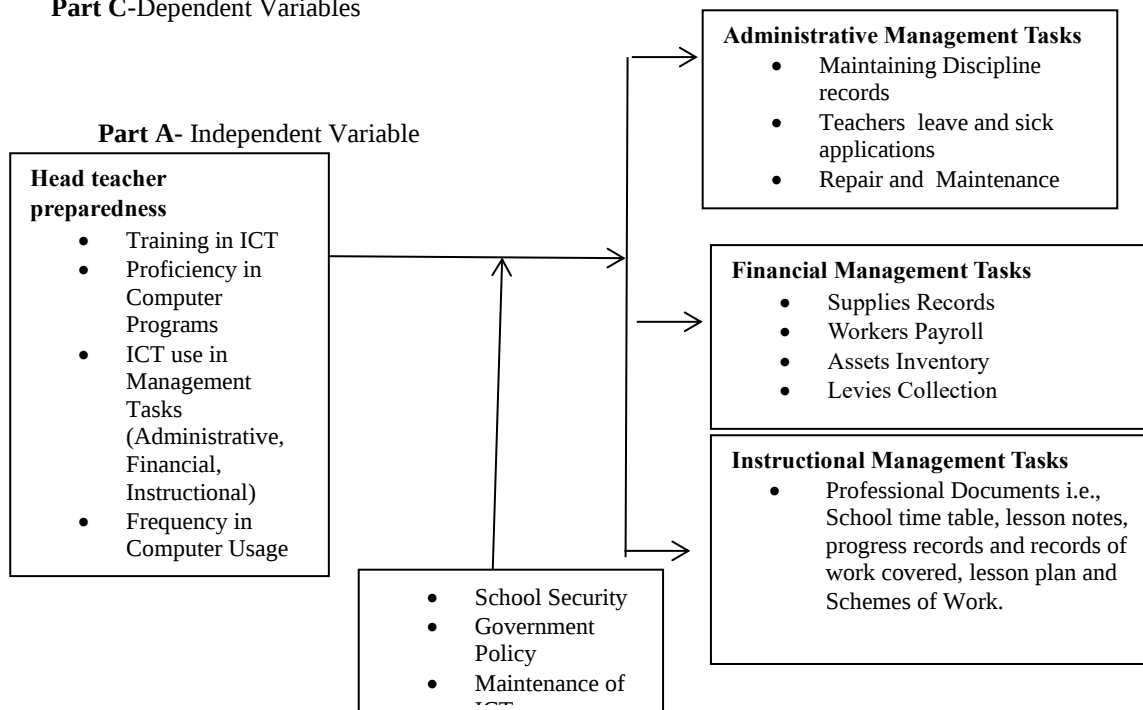


issue in many countries. Whereas in the developed countries ICT integration is encouraged at the level of school management, the demand for ICT integration in SMTs keeps growing steadily. This suggests that the current generation of HTs need ICT for an effective management.

CONCEPTUAL FRAMEWORK

The conceptual Framework that guided the study (Fig. 1) shows factors that constitute preparedness for ICT use in school management (Part A-Independent Variables) and ICT use in school management tasks can be influenced by intervening variables (Part B) leading to its various use in SMTs (Part C- Dependent Variables). The factors are based on variables reported in various literature to influence teachers' use of ICT in schools (Ukanwa & Chiemeka, 2021; Njeru and Wanjau, 2020; Omoso & Odindo, 2020). The framework shows, for example, shows that Head Teachers' (HTs) preparedness to use ICT in management of primary schools is dictated by their training in ICT such as proficiency in computer programs (Part A). The training may be influenced by various intervening factors in the Kenyan context such as government policy (Part B). Such ICT training can then lead to improved ICT skills and knowledge that teachers can then use to perform various SMTs such as administrative, financial and instructional (Part C) as shown in the conceptual framework of the study in Figure 1. The framework was useful in guiding data collection such as formulating data collection questions, organization of data and also in data analysis particularly in coding of qualitative data into various themes.

Part C-Dependent Variables





Part B- Intervening Variable

Figure 1: Conceptual Framework (Ukanwa & Chiemeka, 2021; Njeru and Wanjau, 2020; Omoso & Odindo, 2020)

METHODOLOGY

This study employed descriptive survey design which permits collection of information by interviewing or administering a questionnaire to a sample of individuals (Gray, 2014; Orodho, 2010). The design enabled describing, recording, analyzing and reporting conditions and the state of affairs as they exist (Kothari & Garg, 2016) while at the same time permitting exploration of emerging insights from data for interesting results and not for generalizations. In this study data was collected from the respondents concerning HTs' preparedness to use ICT in management of primary schools in Ndhiwa Sub-County, Kenya to be able to describe the situation and new insights as it is.

According to Ministry of Education (MoE), Ndhiwa sub-county schools in Homa-bay County, Kenya are divided into 6 zones for management purposes (MoE, 2023). The sub-county has a total of 153 public primary schools (Shulezote website). Probability sampling was therefore used to select 30% of these public primary schools giving a total of 46 public primary schools for the study. According to Mugenda and Mugenda (2019), 30% sample size is adequate for any study on a large population to keep it manageable. All the 6 zones of Ndhiwa were picked through census sampling to form part of the sample size with names of the schools written on a card, folded and put in a box. The folded cards were mixed and 46 out of 153 schools was randomly sampled to participate in the study. 46 HTs whose school's name appeared on the picked cards were purposively included as respondents for the study because they had the experience on ICT use in SMTs that was critical in answering the research question (Etikan, Musa & Alkassim, 2016). Additionally, all the 6 CSOs from the 6 zones in Ndhiwa were picked through census technique to participate in the study as key informant interviewees (Braun & Clarke, 2013). The CSOs were better placed to give a position on the topic (Creswell & Poth, 2016) such as the level of ICT training and support teachers get at the Sub-County level for their SMTs.

The study used questionnaires to collect data from HTs and interview guides for the CSOs. Whilst questionnaires ensured collection of large amounts of confidential information from many respondents and cheaply (Denscombe, 2014; (Kombo & Tromp, 2006), interviews permitted free responses by respondents and further probing by the researcher for in-depth understanding of the phenomena (Braune & Clark, 2013; Mugenda & Mugenda, 2019). The quantitative data was analyzed descriptively into frequencies and percentages (Gray, 2014) while qualitative data was transcribed verbatim and subjected to thematic analysis in line with the conceptual framework of the study and research question. A coding scheme was developed for qualitative data from the interviews guided by the variables identified in the conceptual framework of the study (Braun & Clarke, 2013). The codes for School Management Tasks (SMTs), for example, were categorized into Financial Management Tasks (FMTs), Administrative Management Tasks (AMTs) and Instructional Management Tasks (IMTs). Furthermore, the researcher examined all the coded qualitative data and critically made inferences in line with the research questions and the conceptual frame work of the study. The



thematic analysis helped the researcher to explicitly report some quotes from respondents and to compare and contrast them among respondents for trustworthiness and also to triangulate them with the quantitative data for compelling and interesting results (Denscombe, 2017; Gray, 2014).

RESULTS AND DISCUSSION

The study sought to determine the HTs preparedness to use ICT in SMTs. With regard to training on ICT, HTs were asked whether they have had any training in ICT and who sponsored it. Results show that a majority of HTs (87%) had received training on ICT. Surprisingly, many of these HTs (69%) sponsored their own ICT training. A paltry 31% were sponsored by the government. From the findings, it was evident that majority of the HTs had received training on ICT to support their SMTs. However, the self-sponsorship effort by many HTs seems to contradict data from the key informant interviews with CSOs indicating that numerous workshops and seminars had been organized to train HTs on ICT in the Sub-County. CSO2, for example, said: *“We organize short training for the HTs and some teachers who are focal persons in their respective schools are also trained. During the training, teachers are not expected to pay anything.”* This statement suggests that it is the role of MoE to facilitate ICT training for the HTs free-of-charge. A possible explanation for this contradiction between the questionnaire and interviews results could be that due to resource constraints, the ICT training provided by the CSOs in Ndhiwa Sub-County only sampled a few of the 46 HTs some of which may not have been the respondents to this study. It is also possible that the CSOs might have over-represented what they do in terms of the ICT training they give teachers.

The finding on a concerted effort by a majority of HTs to sponsor themselves for ICT training at (69%) is a new knowledge this study brings forth. This finding has not been reported by previous studies. The finding could be a pointer of an external pressure from the government on HTs to use ICT to relay some important information on learners through the National Education Management Information System (NEMIS) to MoE. NEMIS is a digital platform used by MoE to manage, and streamline education data from schools. With this finding, it is probable that the CSOs hardly provided ICT-related Continuous Professional Development (CPD) for all the HTs in the sub-county thus making them obliged to do more on their own to comply and respond to the NEMIS requirements. Closely aligned to this finding is a study by Gesare (2023) which found that teachers of Kiambu County advocated for ICT exposure through school-sponsored ICT training, seminars and workshops, yet, schools did not offer any sponsorship programs to train them in ICT. It is in such kind of outcomes that teachers are left little option but to find their own means to learn and improve their ICT skills through self-sponsorships. The danger here is that lack of sponsorship could hamper the use of ICT in SMTs particularly for the economically disadvantaged HTs. Although Lufutu (2017) suggested that schools should take responsibility to train their principals to acquire ICT skills, there remains a challenge for some schools particularly the resource-strained public primary schools to sponsor their teachers for ICT training. It is in this backdrop that government through MoE ought to provide the relevant ICT-related training to HTs in Ndhiwa to improve their proficiency and efficiency in performing their SMTs

Proficiency in Computer Programs

HTs were probed on how proficient they were with regard to computer programs that they used in SMTs in their schools and the results appear in Figure 2.

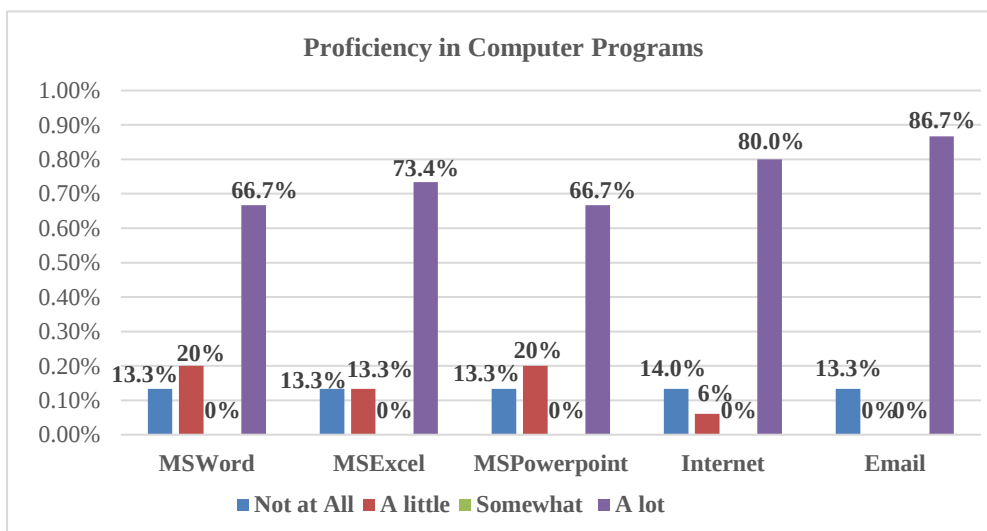


Figure 2: The HTs proficiency in computer programs

First, on the use of computer programs results in Figure 2 show that while 86.7% of the HTs were using e-mail a lot to perform SMTs, 13.3% did not use it at all. This inability by some HTs to use the e-mail at all to perform SMTs might probably be due to lack of relevant training or lack of internet infrastructure. This finding concurs to a study by Ndegwa, Githui and Njoka (2023) that also found e-mails being instrumental for HTs school management operations. The highest score in the use of e-mail could be due to the frequent communications and transmission of needed administrative documents between the HTs and other stakeholders like The Kenya National Examinations Council (KNEC), Ministry of Education (MoE) through NEMIS, Kenya Institute of Special Education (KISE), Kenya Institute of Curriculum Development (KICD), Board of Management (BoM) among others. This was confirmed by one CSO who said: “E-mails assist HTs in communicating with MoE, KNEC, BoM, among other stakeholders.” This statement suggests that e-mail highly helps HTs perform their administrative SMTs.

Second, results show that 80% of the HTs used internet a lot to perform SMTs with 14% not using it at all (see Figure 2). Internet is very instrumental to HTs for online communications with other stakeholders through online platforms. For instance, HTs were using the internet to register learners for KNEC examinations, filling Teacher Performance Appraisal and Development (TPAD) and online registration of learners to National Education Management Information Systems (NEMIS) as explained by CSO1.

HTs use internet a lot to feed and access information on the National Education, Management Information System (NEMIS), place teacher transfers, apply for leave,



conduct Teachers Performance and Development (TPAD) appraisals, conduct online meetings and upload results. However, some HTs achieve these at the cyber cafe.

The statement of CSO 1 suggests that, internet and mailing system just like any other computer program are important for all HTs in carrying out their administrative SMTs. The findings contradict that of Fidelis and Onyango (2021) in Tanzania which found that schools lack internet connection. The CSO1 remark that some HTs visit Cybercafés for internet suggests there still exist poorly developed internet network or infrastructure in some schools. Alternatively, it is also possible that access to internet by primary schools in Ndhiwa could be expensive and out of reach to some schools due to expensive internet tariffs from network providers. Similarly a study by Njeru and Wanjau (2020) in Kenya found that internet connectivity that are critical for supporting management processes was quite low in schools thus hindering the use of internet by HTs to perform SMTs. Although some schools have access to internet routers, the biggest barrier is making the gadgets reliable and useful (Ndeka, 2024). According to Ndeka (2024), teachers reported that internet connections were extremely unreliable and non-existent.

Additionally, the results indicate that 73.4% of the HTs were using MS Excel a lot to carry out their SMTs. The result supports the argument by Ndegwa, Githui and Njoka (2023) in Kenya that ICT integration like the use of MS Excel can help HTs to perform SMTs. According to CSO5 some of the SMTs performed by HTs through MS Excel include making spread sheets where school data is keyed in and submitted to different stakeholders. The CSO5 argued, *“MS Excel is very important for the HTs because through the program, they are able to key in and store data in form of spread sheets concerning school activities.”* This statement suggests that MS Excel helps HTs in performing SMTs. The findings concur with the study of Abdi et al. (2021) that established HTs using MS-Excel a lot to perform SMTs.

Finally, results show that HTs also use MS-Word and MS PowerPoint a lot both at 66.7%. 13.3% of the HTs did not use the two computer programs at all. According to Hero (2020) proficiency in the use of MS word helps teachers to type information that is printed, stored or disseminated online. Since MS-Word is the foundation of computing skills, most HTs could have acquired the skills to facilitate their daily operations including in SMTs. This is confirmed by CSO1 who explained that, *“MSWord helps HTs in writing minutes and taking notes in BOM meetings.”* This statement suggests that MS-Word also helps HTs in performing administrative SMTs. The findings support the argument by Kipchumba (2021) who asserted the need for school managers to effectively use ICT programs like MS-Word and Power Point in all their management tasks. Kipchumba (2021) for example, argued that MS-PowerPoint is a program that most HTs need for their presentations such as in preparations of slides for presentations in meetings with school managers. CSO 3 confirmed this during the interview pointing out that, *“MS PowerPoint assists HTs in developing slides that they can use in presentations using power point.”* The findings support that of Dhital (2018) that MS PowerPoint is used by HTs to present information to stakeholders.

ICT use in School Management Tasks

HTs were also asked their SMTs that are supported through ICT use. Results show that SMTs performed by the help of computer programs were generally below average with



administrative SMTs at (45.1%), instructional SMTs at (27.5%) and financial SMTs at (20.7%). It appears that most HTs did not fully use ICT to support their SMTs but rather relied on manual methods as observed by CSO2 who said, *“it is high time for teachers and their heads to use technology to perform all administrative tasks rather than going manually most of the time.”* The opinion of this CSO suggests that although primary school HTs use ICT sparingly to perform SMTs, they still prefer doing such tasks manually and therefore should be inducted further to fully integrate ICT use in performing SMTs.

Results also show that although ICT use to perform SMTs was generally low, teachers mainly used ICT to perform administrative SMTs at 45.1%. The findings support Ukanwa and Chiemeka (2021) argument that HTs use ICT in daily administrative tasks to make their work more efficient and effective. Muhonen et al. (2023) equally concurs that ICT integration provides the opportunity for HTs to effectively perform their administrative SMTs. Results also show that use of ICT by HTs to perform Instructional Management Tasks was low at 27.5%. The findings support that of Bariu (2020) who found the use of ICT was still very low as most HTs were developing instructional materials manually thus making their work more tasking and extraneous. This was echoed by CSO2 that: *“teachers generally write lesson notes, schemes of work, timetable, progress records, records of work covered and lesson plans. If these professional documents were produced through ICT, they would look neat and of high quality.”* From the sentiment of CSO2, it is evident that although ICT enhances quality of instructional SMTs, teachers still lag behind in making better use of it to improve their instructional materials most likely due to rampant ICT illiteracy.

Financial Management Tasks were being performed by 20.7% of HTs using ICT. Although this finding is to some extent in line with that of Oyier et al. (2015) who found that HTs use ICT to automate school financial account for prudent management of school finances, ICT usage in performing this task remains very low. ICT use in financial SMTs has the potential to help HTs to pay different support staffs easily without handling the cash physically. The low use of ICT in financial SMT could be due to lack of sufficient knowledge about electronic book keeping techniques. During an interview with CSOs, it was discovered that most of the HTs keep financial records in hard cover books. However, this method is not safe as argued by CSO3 that: *“It is sad that at this electronic age, most of our HTs still keep financial records in form of books that can easily be destroyed or manipulated. For sure they should be exposed enough to accept technology in its totality.”* The sentiments of CSO3 suggest that adoption of ICT in financial management could enhance financial accountability in schools.

CONCLUSION AND RECOMMENDATION

Although a majority of HTs (87%) had received training on ICT with 69% sponsoring their own training, the HTs' use of ICT in performing SMTs generally remains low in Nhiwa. Results also show that many HTs mostly use internet and emails to perform various SMTs in their schools. Also, the HTs use of ICT for performing SMTs in Ndihiwa were found to be for administrative, Instructional and financial SMTs respectively. Based on these finding, the study recommends that to improve HTs' use of ICT in performing SMTs from the current low to high usage, MoE ought to conduct a targeted ICT-related Continuous Professional Development (CPD) program for HTs upon identifying their training needs and to also



provide requisite ICT infrastructure to primary schools in Ndhiwa alongside full sponsorship for compulsory ICT training to all HTs.

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