

ICT Literacy among Teachers and Administrators in Secondary Schools towards Effective Management of Students' Academic Records in Tanzania - The Case of Arusha City Council

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Abstract: *The use of Information and Communication Technology (ICT) within schools is an infusing aspects of school practices that benefit all staff and school activities including both teachers and students at large. Tanzania has made several efforts to achieve this but little has been done to determine the readiness of secondary school teachers and administrators in terms of their literacy in using ICT infrastructure and tools to effectively manage students' academic records. This study aimed to assess the level of ICT literacy among teachers and administrators towards effective management of students' academic records in secondary schools in Arusha City Council. Data was collected through survey using interviews and questionnaires where by 120 respondents were involved from 10 secondary schools. Analysis of quantitative data was assisted by SPSS (Version 22.0) utilizing descriptive statistics for frequencies, mean, and standard deviation, and presented in form tables. Qualitative data were thematically analyzed and presented in form of tables and paraphrasing. The study found that majority of teachers have attended ICT trainings and are competent in word processing application but do not use computers to manage students' academic records. Keeping students' records using ICT helps to improve managerial capacity of schools and students' academic performance by providing easy access to students' examination results, tracking progress, serves time in processing reports and assist to making informed decisions. Recommendations include supply of ICT tools and facilities in secondary schools and empowering teachers on using them to manage students' records. There should be clear standard of records keeping practices which can accelerate decision making and improving information sharing.*

Keywords: Information and communication technology, ICT literacy, Students Academic Records and Management

1. Introduction

The use of ICT within schools is an infusing aspects of school practices that benefit all staff and school activities at large (Harry, 1990). In East African countries for example, managers in secondary schools are reported to take increasing interest in the scope of ICT in schools, where considerable investments were devoted on the purchase of ICT equipment and tools even before the establishment of ICT policies within these countries (Kavagi, 2011). ICT tools in secondary schools in developing countries such as computers and the Internet are used in providing communication and teaching of students in the classroom (Passey, Forsyth, Hutchison, Williams, & Scott, 2002; Miller & Miller, 2001; Webber, 2018).

With respect to managing records at school, the presence of Information and Communication Technology (ICT) has caused a major paradigm shift in how we approach the gathering, storage, retrieval, and analysis of information in every industry including education (Jankowski, 2012, p. 57). ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical telecommunication systems and networks (cellular, broadcast, cable, satellite, postal) as well as the services that utilize them (Internet, voice, mail, radio, and television) and Information Technology (IT) that refers to the hardware and software collection of information, storage, processing, and presentation. (UNESCO, 2012, p. 107). Also it consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of

information (voice, data, text, images), as well as related services (Katundu, 2000, p. 27).

ICT in education initiatives in Tanzania started in 2002 when a stakeholders' workshop was called by the ministry with support from the International Institute for Communications Development (IICD), a Dutch NGO (Mbwette, 2009, p. 17). The round table identified areas of ICT interventions and project proposals were generated. These projects helped to raise awareness of the benefits and potential gains in adopting ICT in education sector which in turn elevated ICT to a priority area in education planning (ibid, p. 18). In recognizing the potential of ICTs as significant tool for improving education system, the Government of Tanzania developed its national ICT policy in 2003 (URT, 2003, p. 3). Four years later, the Ministry of Education and Vocational Training (MoEVT), developed an ICT Policy for Basic Education in 2007. The ICT policy of 2007 addresses issues related to infrastructure and technical issues; curriculum and content; training and capacity building; planning, procurement and administration; management and support; and monitoring and evaluation. According to the policy, priority levels include teacher's education, secondary education and primary education. In a nutshell, the main objectives of the policy, are to integrate the use of ICT to achieve educational policy objectives, facilitate and promote the use of ICT resources in schools, colleges, and libraries (URT, 2007, p. 2). The integration of ICT in basic education subsector, is expected to yield several outcomes including the improved efficiency and effectiveness of the management and administration of education at all levels (URT, 2007, p. 4).

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2. Statement of the Problem

In Tanzania, the education sector has made several efforts to implement and achieve the benefit of the ICT Policy for Basic Education. The Government through MoEVT has implemented several programmes and initiatives that aim at implementing the policy since it was developed in 2007. The goal was to integrate ICT in the teaching and learning process as well as in management and administration of schools. Such initiatives include National Programme on ICT for Secondary School Teachers; the e-Schools Project and the introduction of ICT Curriculum in secondary schools (Ngeze, 2017). These initiatives have contributed to the use of ICT in teaching and learning process, and in performing school administrative tasks. Despite the success registered in education sector on the use of ICT and the possession of ICT tools and facilities, but little has been done to determine how literate the teachers and administrators in secondary school in terms of their skills in using ICT tools and infrastructures to effectively manage students' academic records. This study therefore intended to assess the level of ICT literacy among teachers and administrators in secondary schools towards effective management of students' academic records.

3. Literature Review

Jankowski (2012) in his book titled "guidelines for school technology development plans" asserted that, there are many activities in a school that require records of students such as registration of new students, processing of examination, timetabling, attendance, disciplinary cases and organization of parent reports, among others. All these are activities which need records of students to be recorded and stored safely for retrieval when they are needed. Nwaomah (2015) insisted on student's records to be critical in achieving institutions' goals and objectives, "for instance in a secondary school, academic records bring up to information or data relating to students both in paper and electronic formats that provides evidence of registration, discipline and examination amongst others" (p. 119). Further, a school might also receive information about its students from other organizations or institutions which means, records can either be generated internally or externally (ibid. p. 120).

Record-keeping occupies a strategic position in the efficient and effective management of any educational system because it documents the planning and implementation of appropriate course of services allowing proper monitoring of works (Bush, 2011, p. 39). Abdulrahman (2015, p. 52) in citing Usanga (2007) submitted that, "records are primarily considered as any information or communication captured and retained in some reproducible media". According to this author, records in this case become the object, the document or medium, which carry information and therefore, records are information media created and valuable enough to be retained (p. 53). Most records are paper-based; that is to say that information was captured on paper but the media for information carriage can also be in other forms like machine readable disks, graphics, images, diskettes, flash drives and pictorial media, be they photographic or not (ibid p. 54).

Managing records according to Abe & Adu (2007) entails "proper and adequate storage, filing procedures, retrieval tools, and disposal or retention schedules to guarantee efficiency, effectiveness and accountability during which records are actively managed" (p. 171). This needs to be done via implementation of records management policy that align with aims and objectives of organization or institution to which it refers (ibid, p.172). Proper management of students records means establishing systematic controls at every stage of the records life cycle, in accordance with established principles and accepted models of records management (Kavagi, 2011, p. 48). Nakpodia (2011), summarized the value of educational records management as 'facilitation of continuity in the administration of a school provision of information needed by students for higher and other related institution and employers, for admission or job placement, provisions of data for planning and decision making by heads of school, ministries of education and other related education authorities" (p. 47).

Juma, Raihan, & Clement (2016, p. 6) in their paper about, "Role of ICT on Education Management in Secondary Schools in Uganda" concluded that, ICT increase effectiveness in management of students' records because it help in organization of students' Information, analyzing students' data quickly and accurately, increased coordination as well as effective and quick decision making. Proper utilization and allocation of resources, access of students' records to the stakeholders, Improvement in monitoring student performance, enhancement of effective communication and planning, were also mentioned by Juma, et al (2016) as among ICT contribution on effective management of records in secondary schools (p. 6).

Oshodin and Idehen (2007, p. 11) asserted that, application and services of ICTs are integral to any meaningful development in the education sector in all aspects including record keeping. These authors also added that, the efficiency of employing ICT systems in records keeping may be seemingly difficult if the basic challenges of ICT are not addressed (p.12). Problems facing the use of ICT in records keeping as adapted from Popoola (2003, pp. 221 -224) are as follows; First, Lack of Basic and Adequate Infrastructures/Resources: The non-existence of basic and adequate physical facilities such as accommodation space for computers with internet connectivity, electric generators and adequate furniture pose great problems in the usage of ICT for records keeping. Second, Lack of ICT Technicians and Personnel: There is shortage of expertise that can handle the installation, operation and maintenance of ICT facilities. These areas are essential to the application of ICT to records keeping and management. Third, Inadequate Funding: Information and Communication Technology facilities are not within the reach of the average secondary schools due to the high cost of acquiring and maintaining them. This is posing a barrier to easy restricted individual access of these facilities for records keeping purposes. Financial resources form a key to the successful implementation and integration of ICT in records keeping and management. Fourth, Lack of ICT Skills: This may pose a problem to records keeping since many academic and non-academic staff that ought to be using ICT facilities are not computer literate and,

therefore, fail to maximally enjoy the benefits offered by ICT in records keeping. Fifth, Interruption of ICT Facilities by electricity and computer network failure during records keeping also hinder users actualize effective utilization of ICT facilities and skills in record keeping.

Education institutions like secondary schools create records to support the activities that they carry out; however, if these records are not managed properly, they will not provide the necessary support and information might be lost causing problems for the institution (Bozeman & Raucher, 2000, p. 226). As stated by Kassimu, Nihukaa, & Florence (2011), "in a complex organization like an education institution, it is not possible to keep every information in the brain because the volume of information is heavy, therefore records must be kept" (p. 325). In Tanzania, Education Policy demands that every educational institution should keep certain school records and students' records such as log books, admission registers, visitors' book, inventories, books of Accounts and students' examination records (URT, 2015, pp. 66-67).

Recently, the Tanzania Ministry of Education, Science and Technology (MoEST) has been providing training to secondary school teachers to equip them with knowledge and skills for integrating ICT in teaching, learning and administration processes (Ngeze, 2017, p. 424). According to Ngeze (2017, pp. 424 - 425), these training programmes were divided into three major cycles; cycle I consisted of topics such as Potentials of ICT, Computer Fundamentals, Operating Systems, MS Word, Spreadsheet, MS-Power Point and Computer Networks and Internet. Teachers are currently taught in cycles II which comprising of topics such as Multimedia, Hardware Installation, Software Installation and Configuration, Maintenance and Troubleshooting of ICT Devices, Safety of ICT Devices and Desktop Publishing. Cycle III consists of two important topics: Introduction to Databases, Database implementation Using MS Access and the Use of ICT in Teaching and Learning. The cascade mode of training according to Ngeze, (2017, p. 425) is being employed where the National Facilitators trained teachers - named Master Trainers (MTs) in fifty nucleus schools who met at one training center. After the training, the Master Trainers are assessed; those who qualified are certified to train other teachers at the secondary schools. All Master Trainers are responsible to disseminate ICT knowledge and skills through In-Service training to other secondary school teachers while National facilitator will continue to monitor the quality of training (ibid, p. 425). Therefore, according to Ngeze (2017), the access of ICT resources and possession of relevant skills will help teachers to effectively use ICT's infrastructure and tools to manage students' information and records more effectively and efficiently.

4. Methodology

The study was conducted in ten (10) Secondary Schools from Arusha City Council in the Arusha region; whereby, five (5) schools were private schools and five (5) schools were public/government owned schools. Data were captured through constructed questionnaire and interviews. Likewise, data were collected in accordance with the specified research objectives of the study which was; to assess the level of ICT

literacy among teachers and administrators towards effective management of students' academic records in secondary schools.

The population included students, teachers and heads of schools in targeted schools. From this population, a sample of 120 respondents was selected. Simple random sampling was used to get fifty (50) teachers, stratified technique was used to get fifty (50) students. Heads of schools were selected purposively to provide in-depth information about availability and use of ICT on managing students' academic records. The findings from questionnaires and interviews formed the basis from which analysis, discussion and conclusions were made.

5. Findings

The study assessed the level of ICT literacy among teachers and administrators that are useful in managing students' academic records. Respondents were teachers, students, academic teachers and heads of schools.

5.1 ICT training to Teachers and Administrators (Heads of School)

The study was interested to discover whether teachers and administrators (Heads of school) had opportunity to take part in any ICT training. Results in Table 1 shows that, majority 48 (80.0%) of teachers had received ICT training while 12 (20.0%) admitted that they had not attended any ICT training.

Table 1: Teachers' Responses on ICT training

No.	Variable	Yes		No		Total	
		N	%	N	%	N	%
1	If a Teacher has received any ICT training	48	80.0%	12	20.0%	60	100%

Source: Field Survey, 2018

The above findings in Table 1 are complemented by other field data in Table 2 which show responses of Heads of School (Administrators) on the interview question, "Have you attended training to acquire ICT skills for managing students' records? How often?" Results indicate that majority, 8 respondents out of 10 agreed by "YES", that they have attended ICT training, compared to only 2 who disagreed by "NO". Additionally, majority, 8 respondents out of 10 commented that not often they attend training compared to only 2 who attend the training often.

Table 2: Heads of School Interview Responses on ICT training

Question	YES (X/10)	NO (X/10)	Very Often (X/10)	Often (X/10)	Not often (X/10)
Have you attended training to acquire ICT skills for managing students' records? How often?	8	2	0	2	8

Source: Field interview, 2018

These findings indicate that most teachers in secondary schools were aware of the ICT and had attended at least some training relating to ICT. And that at least one head of

school in secondary school had attended ICT training at least once.

5.2 How Often Teachers use Computer when dealing with Students' Records

This study was also interested at discovering how often teachers use computer when dealing with students' academic records. As presented in table 3, the study finds that, majority 38 (63.3%) of teachers do not at all use computer to manage student's academic records, some few 6 (10.0%) and 10 (16.7%) uses computer at least once a month and once a term respectively to manage students' academic records. However, only 2 (3.3%) teachers uses computer once a week and 1 (1.7%) teacher who use a computer daily to manage students' records.

Table 3: How Often Teachers use Computer when dealing with student records?

How Often Teachers use Computer when dealing with student records?		
Options	N	%
Daily	1	1.7%
Once a Week	2	3.3%
Twice a Week	3	5.0%
Once a Month	6	10.0%
Once a Term	10	16.7%
Not at All	38	63.3%
Total	60	100%
	Mean	5.27
	Std. Deviation	1.205

Source: Field Survey, 2018

This implies that, majority of teachers do not interact with computer (the basic ICT tool) when dealing with students' academic records.

5.3 How Teachers Master Using Computer Applications to Manage Students' Academic Records

This study also looked at the competence of teachers on using computer applications to manage students' academic records. As depicted in Table 4, teachers have ICT related competence to include word processing, spreadsheet, Internet and e-mails.

Table 4: How teachers master using computer applications to manage students' records

No.	Applications	Mean	Std. Deviation	Remark
1	Word Processor (e.g. MS-Word)	2.33	1.13	Good Mastery
2	Spreadsheet (e.g. Excel)	3.08	1.12	Fair Mastery
3	School Management System (SMS)	3.40	0.98	Do not Master
4	Internet and email	2.73	1.15	Fair Mastery
5	Database (e.g. Access)	3.40	1.01	Do not Master

Source: Field Survey, 2018

These findings implies that if the schools are supplied with ICT tools and facilities, it can be easy to keep records relating to examinations, financial, discipline and other

records especially those relating to students' progress such as parent reports.

5.4 Use ICT Tools to Manage students' Academic Records

ICT Tools and facilities can be used during and in different activities that involve students' academic records. It was necessary for the study to establish different types of activities that teachers and administrators in secondary schools can use ICT tools to manage students' records. As depicted in Table 5, the findings revealed that, majority of respondents accepted items 1, 2, 3, 4, 7 and 8, that they use ICT tools and facilities for preparing student results and reports, preparing students test and examinations, grading students marks, recording and storing students' scores/marks, prepare students Continuous assessment (CA) for NECTA and storing students examination records. On the other hand, teachers do "not accepted" in their majority for Items 5, and 6 when asked if they use ICT tools and facilities for storing students' attendance records and providing students' access to their results through internet respectively.

Table 5: How Teachers use ICT Tools to manage students' academic records

No.	Item	Mean	SD	Remark
1	Preparing students test and exams	1.03	0.181	Accepted
2	Grading students marks	1.12	0.324	Accepted
3	Recording and storing students' scores/marks	1.13	0.343	Accepted
4	Prepare student results and reports	1.38	0.49	Accepted
5	Storing students attendance records	1.93	0.252	Not accepted
6	Provide students access to their results through internet	1.93	0.252	Not accepted
7	Prepare students Continuous assessment (CA) for NECTA	1.23	0.427	Accepted
8	Storing students examination records	1.12	0.324	Accepted

Source: Field Survey, 2018

This means that ICT tools and facilities enable teachers to improve their activities because those activities formerly were done manually can now be done electronically and be shared among key stakeholders; which in turn facilitate decision making process at school level and beyond. However the results in Table 5 about different types of activities that teachers and administrators in secondary schools can use ICT tools and facilities to manage students' records are complemented by students' responses in Table 6 when students were asked, "How often your teachers use computer to process the following records when doing their daily academic activities?"

Table 6: Students Responses on How Teachers use Computer to process students' Records

No.	Options	Mean	SD	Remark
1	Attendance records	3.36	1.01	Not at all
2	Test Score records	1.4	0.76	Often
3	Registration records	3.18	1.02	Not at all
4	Disciplinary records	3.54	0.71	Not at all
5	Examination records	1.28	0.57	Often
6	Financial records	1.58	0.97	Often

Source: Field Survey, 2018

Thus, from student perspective, their teachers use computers frequently when dealing with test score records, examinations and financial records. Meanwhile, students responded that, their teachers “not at all” use computers when dealing with attendance records, registration records and disciplinary records. This signifies that at least core activities are now done with assistance of ICT tools and facilities. Of course, it is under this parameter that even decision making process can easily be simplified because records are easily accessed and retrieved.

5.5 Challenges Hindering the Use of ICT for Managing Students’ Academic Records

It was revealed from the findings that, (see Table 7) poor maintenance of ICT equipment, epileptic power supply, inadequate ICT facilities, lack of relevant ICT skills on the part of records management and poor installation of ICT related facilities can hinder performance of schools in terms of decision making and planning because records cannot easily be accessed and shared among decision makers. Similarly, keeping hard copies of students records can also occupy unnecessary storage space of the records.

Table 7: Challenges hindering use of ICT for Managing Students’ Academic Records

No.	Challenges	Respondents Teachers (X/60)	Percent (%)
1	Epileptic power supply	54	90.0%
2	Inadequate ICT facilities	57	95.0%
3	Lack of relevant ICT skills on record management	58	96.7%
4	Identified poor installation of ICT related facilities	47	78.3%
5	Poor maintenance culture of ICT equipment	60	100.0%

Source: Field Survey, 2018

6. Summary, Implications and Recommendations

The idea of students’ records management has to do with the control of students’ registration, discipline, examination financial records among others, passing out of current and semi-current stages into archival care. ICTs can help storage of this information and records due to its ability of storing large amount of information over a long period of time with great flexibility in remote access, sharing, and dissemination. However, proper records keeping of students can easily be improved through application of ICT.

Findings showed that majority of teachers have attended ICT trainings and are competent in word processing application but do not use computers to manage student’s academic records. Little or no practice of using computer in dealing with student records have impact on teachers’ competence and mastery of using ICT tools to manage students records. Teachers are more likely to apply ICT skills they have learned during training if they put those skills in to practice in their schools. Similarly, it was further revealed that even heads of schools do not often get opportunities to participate in ICT training. But little participation by heads of schools in ICT training can impact students’ records management

because heads are the key decision makers who need to have better understanding in all activities undertaken by their schools. Major challenges hindering the use of ICT for keeping students’ records are epileptic power supply, lack of relevant ICT skills on records management, poor maintenance of ICT equipment and inadequate ICT facilities.

The study recommends that, heads of schools and teachers should be empowered on ICT applications in order to improve their practice of using ICT to manage students’ record in schools. Also schools should also develop a clear standard of records management because, records of students are of great importance in schools as these records assist the school management to make good plans for developing the school, and records of students can save a lot as when they are well utilized, accessed and retrieved can improve informed decision making at school level and beyond. Standard records management practices will entail easy access, retrieval and sharing of information.

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