

Original Research Article

Secondary School Teachers' Knowledge and Practice towards the Use of ICT

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Abstract

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This study investigated the secondary school teachers' knowledge and practice towards the use of Information and Communication Technology (ICT) in teaching and learning process in Tanzania. The objectives were to investigate teachers' knowledge on the use of ICT in teaching and learning and examine their practice on the use of ICT in classroom. The study used interview protocols, discussion and practical observations as instruments for data collection. Findings from the study showed that most secondary school teachers lacked proper knowledge of using ICT facilities in teaching and learning process. Although there were few ICT facilities in the visited schools but they were not enough compared to the presented number of teachers and students. The study concludes that, the effective use of ICT in teaching and learning process in Tanzania secondary schools can be achieved through cooperation among education stakeholders, including the Government, schools, teachers and parents.

Keywords: ICT, Knowledge, Practices, MoEVT, Secondary school, UDOM

INTRODUCTION

According to Swart and Wachira (2010) the introduction and the use of ICT in teaching and learning is facing the challenge including inadequate electricity infrastructure especially in the rural areas. This hinders the spread of ICT technology in different schools; hence, teaching through ICT becomes ineffective. MoEVT (2007) noted other challenges facing the use of ICT in Tanzania to be insufficient number of qualified technical personnel to manage and maintain ICT resources, insufficient financial resources to ensure the equitable and sustainable integration of ICT in education and lack of enough ICT facilities that could be supplied to all schools.

Like other developing countries, teachers and students in Tanzania are facing the problem of integrating ICT in classrooms due to lack of ICT competencies, attitude and perceptions towards the use of ICT, and limited motivation (Nihuka and Bingmlas, 2009). Doyeka and Gafufen (2013) identifies the other challenges facing the use of ICT in Tanzania secondary schools, areas insufficient classes to be used as ICT laboratory, lack of

professional ICT teachers, and inadequate number of computers and other ICT facilities.

Efforts are made to address them some of these challenges. In August 2005, the Government of the United Republic of Tanzania in collaboration with the Swedish Government through the Swedish International Development Agency (SIDA) initiated a project for introducing ICT in all government teachers' colleges. The project's main goal was to improve the quality of pre-service and in-service teacher education by using ICT. The project succeeded to reach all teachers colleges in Tanzania (MoEVT, 2007).

Other initiatives are currently being done in Tanzania to improve the use of ICT. Among the efforts done are the initiatives to train teachers and administrators under the donation of Education for Empowerment, Rotary

Club/UK and Bright Education Trust Fund. Schools were provided with new computers under the donation of Rotary Club and Barclays Bank in order, to improve pedagogical and provide subject support to secondary

Table 1. Respondents involved in the study

Respondents	Expected	Number of Respondents Available in the Field		
		Male	Female	Total
Teachers	20	10	10	20
Heads of Schools	5	4	1	5
Students	15	7	8	15
TOTAL	40	21	19	40

Source: Field Data

Table 2. Sampling Technique, Tools of Data Collection and Kind of Information Collected

Sample	The sampling technique	Tools for data collection	Information collected
Heads of Schools	Purposive	Interview	ICT facilities which facilitate teaching and learning and practice of teachers towards the use of ICT
Teachers	Purposive	Practical observation checklist and interviews	Practice of the use of ICT facilities, attitudes toward the use of ICT and frequency of the use of ICT facilities
Students	Simple random	Interviews and Discussion	Practice of teacher toward the use of ICT and teachers frequency use of ICT

teachers under Spider, OUT, UDSM, NoPC, and MoEVT. The use of mobile phones in training teachers to deliver Mathematics and Science contents under OUT, Bridge-IT and SIDA was piloted (Swarts and Wachira, 2010).

Statement of the Problem

There are numerous studies done in Tanzania about the use of ICT in teaching and learning in teachers colleges (e.g. Kalinga, 2008; Nihuka; 2010; Mwalongo, 2011). These studies found that there was a need to increase ICT facilities in teachers training colleges in order to raise teachers' perception toward the use of ICT; as there are challenges of lack of teaching and learning materials including books, chemicals and other facilities. Lack of ICT use in the schools has resulted to the dominance of the use of chalkboard as the only approach of teaching. Thus, this study, therefore, tried to establish the information on the current teachers' knowledge and practice towards the use of ICT in teaching and learning in order to raise community awareness on the importance of the use of ICT facilities to help students to understand the lesson clearly.

Objectives of the Study

The main objective of this study was to examine secondary schools teachers' knowledge and practice towards the use of ICT. In order to achieve this main objective, the following specific objectives were developed.

- Investigate teachers' knowledge on the use of ICT in teaching and learning in secondary schools in Tanzania.
- Examine teachers' practice on the use of ICT in classroom.

METHODOLOGY

Qualitative approach was used in this study as data were analysed in terms of content and thematic approach. Coast Region in Tanzania was a study location whereby secondary school teachers and students were the respondents. (Table 1)

The data was collected through the use of interview, discussion and practical observations. (Table 2)

FINDINGS AND OBSERVATION

Availability of ICT Facilities in Secondary Schools

An attempt was made to explore the availability of ICT facilities in secondary schools in the Coast Region. The findings from observation checklist showed that all five secondary schools involved in the study had ICT facilities. The facilities found in the schools are computer laboratory, computers, scanners, radio, televisions and printers.

However, the available ICT facilities were not enough compared to the number of teachers and students presented in the schools. This was confirmed by students-computer ratio in the visited schools which is 1:57. It implies that 57 students were able to use 1 com-

puter at a time. This ratio is very high regarding the practical requirements in using computers. On the other hand, teachers-computer ratio in all school was 1:4, where four teachers share one computer at a time.

This implies that there were inadequate ICT facilities in secondary schools. This was also explained by heads of school during interview. They explained that there were no enough ICT facilities in their schools which hindered effective use of ICT in teaching and learning.

Secondary School Teachers' Knowledge on the Use of ICT Facilities

Investigation of secondary school teachers' knowledge on the use of ICT in the whole process of teaching and learning revealed that teachers' knowledge on the use of ICT facilities tended to increase the practice of the use of available ICT facilities. Out of the interviewed 20 secondary school teachers, 15 (75%) showed to understand what ICT means and 5 (25%) did not have any idea about what ICT means. During the interviews, the teachers hardly mention the ICT facilities they knew and which ones were available in their schools. One teacher who did not have correct idea about ICT had this to say:

...I know nothing about the ICT terminology because I haven't come across...

The most known ICT facilities to the teachers who were aware are computers, mobile phones, projectors and printers. However among the most unknown ICT facilities to the teachers were scanner, television and radio.

Teachers Knowledge on the Use of Computers

This study investigated 20 secondary school teachers through practical observation checklist to find out their knowledge on the use of computer. The observations involved practical activities of putting ON and OFF computer and the knowledge of the use of MS-word, MS-Excel, MS power point and MS access.

Among the 20 teachers observed on their ability to put ON and OFF computer, 15 (75%) could put ON and OFF computer safely, while 5 (25%) of them could not.

The observations showed that, 15 (75%) teachers were able to use MS Word. These teachers were able to open the program, type a text, edit it and format the text. The remaining 5 (25%) teachers who failed to run MS word explained that they never studies computer applications in.

MS Excel offers a lot of benefits to teachers and students during teaching and learning. However, the findings indicated that out only 12 (60%) teachers were able to use MS Excel. Those teachers who were able to

use MS Excel said that they use it when preparing examinations results and making tables in the whole process of teaching and learning.

Power Point is an electronic slide where a teacher can embed files such as texts, music, pictures, and diagrams during teaching. However, only 10 (50%) teachers were observed to be able to use MS Power Point. They reported to have been using PowerPoint in preparing themselves to teach using visual images, audio images, and texts in class using a data projector.

Among the 20 secondary school teachers observed, only 4 (20%) teachers were able to use MS. Those who were able to use MS Access were using it for preparing the students attendance and for the registration purposes.

These data show that many teachers were able to open and shut down the computer but could not use the computer applications effectively. Microsoft Word application is the most used program compared to other program followed by Microsoft Excel, Microsoft Power Point while MS access was the least used computer application by the teachers in secondary schools.

Teachers' Practice on the Use of ICT as a Tool in Teaching and Learning

This section presents the results regarding the secondary school teachers' practice on the use of ICT in teaching and learning in schools. The use of four ICT facilities were sought to be investigated in the study including computer, projector, television and radio.

The Use of Computer in Teaching and Learning

Computer technology is one of the best tools of teaching and learning. The findings from practical observation checklist and interviews with the teachers indicated that 12 (60%) teachers were using computer in classroom teaching while 8 (40%) teachers were not using computer technology in classroom teaching. This shows that many secondary school teachers were using computer in teaching instead of relying chalkboard only.

Teachers' Use of Projector

The use of data projector is one of the modern ways of teaching which reduces teachers' practice of elaborating many concepts. However, the data from practical observation checklist and interviews with the teachers revealed that, out of 20 teachers observed, only 7 (35%) teachers, were using projectors in the whole process of teaching and learning while the remaining 13 (65%) tea-

chers were not using projectors. During discussion, one girl student from school A had this to say:

...I understand better when our teacher is teaching through a projector because it eliminates boredom in classroom and touches many senses like hearing and seeing ...

This implies that students are more interested in subjects when teachers use ICT facilities in classroom.

The Use of Television and Radio in Classroom

The use of television and radio in teaching and learning is one of the important methods of teaching. However, only 3 (15%) teachers reported to have been using radio and television as an ICT tool for teaching..

Generally, those teachers who used ICT facilities commented that they were using these facilities in classroom during teaching, in the preparation of teaching, in accessing materials from internet, in storing the materials like notes, printing and scanning materials for themselves and students. One teacher said:

...The use of ICT is a modern way of teaching; I use it when preparing my lesson, scheme of work, notes and when I meet a difficult problem concerned with teaching, I browse the internet...

DISCUSSION

The review of related literature in this study revealed an extreme scarcity of the ICT facilities in schools. Studies by Bingmlas (2009),; Gray and Souter (2000); Farrell et al. (2007) and Tedla (2012) indicate that there were scarcity of ICT facilities in schools which hindered the application of ICT in teaching and learning. The findings from the literature are not far from the findings of the study which revealed the same problems in the schools.

Infoden (2010) indicated that, in developed countries, the ICT facilities are enormous compared to lest developing countries where they depends solely on old ICT facilities like radios, televisions and printers. Gulbahar (2005) discovered that one of the factors influencing teachers' decision on classroom teaching is availability of ICT facilities. Lack of that leads to ineffective teaching. This study is in line with the finding from this study which has revealed the lack of ICT facilities in schoolsa as compared to teachers and students ratio.

Balnskat et al. (2006), Stiennen (2007) and Kasoko and Tella (2010) found that teachers' knowledge on the use of ICT facilities depends on the knowledge, proper training and appropriate practice. The findings of the contemporary study by Shan and Kandasamy (2013) in

Malaysia indicates that in developed countries teachers were knowledgeable on the use of ICT facilities compared to less developed countries. While, the study done by Tedla (2012) in East Africa indicates that one of challenges facing many African countries is lack of teachers' knowledge of the use of ICT facilities in the whole process of teaching and learning. These studies are in line with the presents study findings and observations that indicate that there is lack of teacher's knowledge on the use of ICT facilities.

A number of earlier studies investigated the reasons why teachers do not use computers in their teaching (e.g. Rosen and Weil, 1995; Winnans and Brown, 1992; Dupagne and Krendl, 1992) and found a list of inhibitors such as lack of teaching with ICT experience, lack of on-site support for teachers to use technology, lack of help in supervising children when using computers, lack of ICT specialist to teach teachers computer skills, shortage of computer, lack of time required to successfully integrate the technology into the curriculum and lack of financial support. These studies in other ways had similar results with the study at hand which revealed the lack of ICT facilities and lack of specialized ICT teachers as well.

The study conducted in India by Rastogi and Malhorta (2013) found that 84% of secondary school teachers in India were knowledgeable and competent in the use of word processing while 72% were knowledgeable and competent on the use of Power Point presentation and 64% were knowledgeable and competence ion the use of spread sheet.

Furthermore, the study indicated that the practice of the use of ICT helps teachers to become more effective, to become successful, facilitators in their teaching and create collaborative learning between students within the class. However, this study found that most teachers ignored the effective use of ICT facilities in their teaching.

CONCLUSION

This study concludes that, the use of ICT in secondary schools is a problem as there are so many challenges associated with the use of the technology in classroom. There are few ICT facilities available compared to the number of teachers and students, low knowledge of teachers on the use of technology in classroom and the lack of motivation. Though there are few ICT facilities available, in many secondary schools but teachers are not educated enough on how to use these facilities. This results into ineffective use of the technology for most teachers in classroom situations (Gulbahar 2005).

SUGGESTIONS

According to UNICEF (2007) the standard of education that children receive depends heavily on the availability of

the teachers. The quality of teachers depends on training especially on the use of modern technology in teaching and learning. The findings in this study have revealed that there is a lack of teachers' knowledge and practice on the use of ICT facilities in teaching and learning. Thus, based on the findings the following suggestions are made:

First, the availability of teacher in-service training programme on the better use of ICT is compulsory. This will ensure that teachers have enough knowledge on the use of ICT in teaching and learning in order to raise the standard of teaching. The programme should be conducted within and outside the schools. Heads of school should prepare ICT training courses to the teachers within the school in collaboration with various organizations that deal with ICT training.

Second, there should be an increase of ICT facilities in schools to meet the number of teachers and students present. This will ensure enough and quick access to computers by teachers and students and then increase the quality of secondary school teaching and learning hence result into better performance.

Third, the Government is required to ensure teacher and students access of ICT facilities to all public secondary schools in Tanzania as per ICT Policy for Basic Education (2007). This will help all secondary school teachers to teach effectively through the use of ICT facilities.

Fourth, teaching ICT as a subject in all secondary school should be compulsory in order to ensure better uses of the technology for future generation. In this study, only one school of all the sampled schools taught ICT as a subject. Thus, efforts are needed to ensure that students in all secondary schools are given ICT skills.

Fifth, student should be given access to ICT facilities. This is most important because in schools visited in this study students were not well informed on the availability of ICT in their schools. Students did not know the varieties of ICT facilities like computer, printers, projectors, scanners and television which were available in their schools. They thought that the facilities were there for their teachers only.

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