

The Contribution Of Information And Communication Technology (ICT) Utilization In Teaching/Learning To Students' Academic Achievement In Selected Secondary Schools In Tabora Municipality

Garaba Athanas M.

Tanzania Public Service College-Tabora

Abstract: *This study was set out to investigate the contribution of ICT utilization in teaching and learning to students' academic achievement. It was specifically aimed at achieving the specific objectives namely:-to find out the level of accessibility of ICT in secondary schools for enhancing effective and efficient teaching and learning in Tabora municipality, to determine the extent to which ICT is utilized in enhancing effective and efficient teaching and learning among teachers and students in Tabora municipality, to determine the contribution of ICT utilization on students' academic achievement, to identify the challenges of ICT that hinder enhancement of teaching/learning among teachers and students in Tabora municipality and to identify the possible solutions to the challenges of ICT in enhancing teaching/learning among teachers and students in Tabora municipality.*

Mixed methods approach was used, where questionnaire and focused group discussion methods were employed as methods for data collection. Teachers (20) were selected basing on purposive sampling technique and students (122) were selected by simple random sampling in which 142 were the targeted sample provided with the closed and opened questionnaires to fill in. Quantitative data were analyzed by using Microsoft office excel software (MS- Excel 2007) and Statistical Package for Social Sciences (SSPS) version 20.0. Descriptive statistics of mean and standard deviation were calculated in order to make inference of the findings. Qualitative data were analyzed using thematic Analysis.

Findings in this study revealed that (i) the available ICT tools to secondary schools were hardly accessed to students (ii) the schools had inadequacy of ICT facilities despite the fact that they are the most important tools in teaching any subject (iii) no clear time table for ICT utilization in most of the schools (iv) most of the computers were used by the administration than students (v) teachers were poorly technological experienced (vi) software were kept and not utilized (vii) teachers were not aware on the changes on ICT policy, curriculum and pedagogy

Keywords: *Information and Communication Technology, ICT Utilization, Teaching, Learning*

I. INTRODUCTION

Information and Communication Technology (ICT) is a varied set of technological tools and resources used for creating, storing, managing and communicating information (Vajargah, 2010). It became more mainstreamed in the last decade supporting growth and jobs; increasing productivity; enhancing the delivery of public/private services and achieving broad socio-economic objectives in the areas of

healthcare, education, climate change, energy, employment and social development (NICI, 2011).

In education, ICT serves as a means of improving efficiency in the educational process (Jones & Knezek, 1993), memory retention, increasing motivation and deepening understanding (Dede, 1998) and promoting collaborative learning, including role playing, group problem solving activities and articulated projects (Forcheri & Molino, 2000). Generally, ICT promotes new approaches to working and

learning, and new ways of interacting (Balacheff, 1993) and equips students with the skills they are expected to have upon graduation (Brandi & Gunter, 2004). Majority of users are increasingly becoming major catalyst of change (Whetston, 2001).

Recently, the United Republic of Tanzania (2011) reported that ICT in Education cannot and should not be separated from the larger national development strategy. For countries which aspire to become knowledge society, ICT and Education should be seen as key drivers in the production and use of knowledge. While it is clear that ICT in Education should be situated not only within the education policy and strategy but also within the broader of national development strategy, the existing national policies and strategies coupled with strong government commitment and understanding of the role of ICT in Education does not guarantee the contribution of ICT in teaching and learning among students. Equally so the basis for the existence of conducive and enabling environment under which ICT can do well and be put to use in contributing to socio-economic development remains to be unclear. Similarly, while the national policies influence the extent to which national ICT and related infrastructure are developed (Tella, 2007), the spread and use of ICT in education still is unaccounted. In addition, the major determinants of ICT utilization to enhance teaching and learning appear to be understated. It is therefore the aim of this study to find out the extent of this ICT was being utilized in Tabora Municipality.

A. THE IMPORTANCE OF ICT IN EDUCATION

Evidence has shown that ICTs have been employed adequately in some fields like industries and financial institutions while less attention has been on the use ICTs for teaching and learning purposes in our schools (MoEVT, 2014).

The ICT in school setting enhances teaching and learning process and motivates students to learn. In the school management level, ICT is used in detailed student data management, on the level of test and term marks; teacher data management, such as attendance and weekly lesson plans (Hadjithoma-Garstka, 2011). Other than follow up of students' achievements, the information that is gained from the computer enables management to follow up on each and every teacher's work (Popkewitz, 2000). Rather than facilitating teaching and learning in the schools, the Headmaster should evaluate the input of the teachers and output of the students. School management information system enhances planning, organizing, and monitoring, and is used as a tool for improving the effectiveness of the educational system in school (Hadjithoma-Garstka, 2011).

In Tanzania, in order to implement the 1995 Education and Training Policy (ETP), the Ministry of Education and Vocational Training (MOEVT) launched the Education Sector Development Programme (ESDP) which was in line with Secondary Education Master Plan (SEMP) in 1998. The aim of SEMPT was to emphasize quality education that included curriculum review, improvement of instructional materials, school inspections, improvement of language skills, quality teaching as well as school rehabilitation (URT, 2004). In

addition, the URT (2011) 'Needs analysis Report' on Teaching and learning science, mathematics and English in secondary schools using ICT (SME-ICT project) has recently showed that the government realizes the goals of broad social development and competitiveness, cannot be addressed without aligning Tanzania's skills base to the needs of the 21st century among which is the use of ICT.

Many findings had revealed the utilization of ICT to achievements of quality and proper education to the state/country and worldwide. The potential impact of ICT on educational institution's efficiency and productivity justify the utilization of technology as it has presumably strong linkages to the institution's competitiveness (Nielinger, 2003) of which technological determinism theory had to be taken into consideration. In the context where the extent to which ICT utilization enhance efficient and effective teaching and learning was still a question to debate on today, this study appeared to be worth pursuing in order to find how ICT was used in schools in Tabora Municipality.

B. STATEMENT OF THE PROBLEM

As the introduction has shown, the use of ICT can enhance effective and efficient teaching and learning among teachers and students. A clear evidence of the extent to which ICT can be used to achieve this purpose in the Tanzanian context particularly in Tabora municipality and elsewhere is still lacking. There is a danger of people embracing the "technological determinism theory" and therefore regarding ICTs as a cure that will solve all development problems without understanding the local context of its utilization, or with ill-conceived expectations of how they would be used (Chacko, 2004; Long & Long, 1992: 19; Moodley & Cloete, 2004). Lack of rigorous knowledge on school ICT utilization in teaching and learning may also cause inequality, fragmentation of the society and social exclusion for those who are not able to use it and participate in the network society (Castells, 1998: 68-69). It is at the back of this problem framework that the extent to which ICT is used in teaching and learning in Tabora municipal schools worth researching.

C. SPECIFIC RESEARCH OBJECTIVES

- ✓ To find out the level of accessibility of ICT in secondary schools for enhancing effective and efficient teaching and learning in Tabora municipality.
- ✓ To determine the extent to which ICT is utilized in enhancing effective and efficient teaching and learning among teachers and students in Tabora municipality
- ✓ To determine the contribution of ICT utilization on students' academic achievement
- ✓ To identify the challenges of ICT that hinder enhancement of teaching/learning among teachers and students in Tabora municipality.
- ✓ To identify the possible solutions to the challenges of ICT in enhancing teaching/learning among teachers and students in Tabora municipality

D. RESEARCH QUESTIONS

The following research questions guided this study:-

- ✓ To what extent are the ICT tools accessible in secondary schools for enhancing teaching/learning among teachers and students in Tabora municipality?
- ✓ To what extent is ICT being utilized for enhancing effective teaching/learning among teachers and students in Tabora municipality?
- ✓ How does ICT utilization contribute on students' academic achievement?
- ✓ What are the challenges facing utilization of ICT in enhancing teaching/learning among teachers and students in Tabora municipality?
- ✓ What are the possible solutions of the challenges of ICT utilization in enhancing effective teaching/learning among teachers and students in Tabora municipality?

II. LITERATURE REVIEW

The recent century has been characterized with some new and outstanding technologies impacting human life, the most important of them is Information Technology (Tapscott, 1998). Studies conducted in both developed and developing countries prove that the educational authorities in the countries among their other activities have given the priority of "ICT Literacy" through developing various educational programs (Tapscott, 1998; Currier, 2001).

A. THEORETICAL FOUNDATION OF THE STUDY

This study basis on *Technological Determinism Theory* which believes that technology shapes how we as individuals in a society think, feel, act, and how society operate as we move from one technological age to another (McLuhan, 1962). It is said that we learn, feel and think the way we do because of the messages we receive through the current technology that is available (Ibid). It is noted that ICT tends to expand access to education, for example, teleconferencing in the classrooms allows both learner and teacher to interact simultaneously with no difficulty and convenience (Fu, 2013).

B. RATIONALE OF TEACHING AND LEARNING USING THE ICTS

While many people are using ICT positively, some are using them negatively (Nagel, 2007). It is therefore obvious that there are two sides of the effects of ICTs usage on relationship building. We can pick out those two sided factors that serve both as advantages and disadvantages, then understand the dangers of the various uses of ICT when developing relationships. By learning about the positive and negative effects of ICT on relationships as a whole, one can make wise decisions on which ICT applications could be used in different kinds of relations and what factors the school should consider (Adoeye, 2010).

C. SYNTHESIS AND KNOWLEDGE GAP

Nielinger (2003) conducted a case study research in three rural districts with tele-centers in Kasulu, Magu, and Sengerema. The aim of the research was to investigate rural ICT utilization in these districts. Data was collected using background interviews and user surveys. A total of 173 interviews were conducted, with ICT users randomly were selected in all three locations. In this study, Nielinger found that rural ICT utilization faces many challenges. Some of these are widespread poverty, lack of skills and scarce resources.

He pointed out that building the necessary infrastructure and covering the running costs, especially of connectivity, puts a much higher burden on rural communities than on ICT users in the urban economic centers. He also found that there was a general lack of guidance with regard to the opportunities provided by the internet. He concluded that ambitious claims on the role of ICTs are rarely in line with reality. The basic dynamics of rural ICT utilization is often misconceived.

In another study, which was carried out in and around three internet cafés in Dar es Salaam, Tanzania, and one Multipurpose Community Tele-centre (MCT) in Sengerema, Mercer (2005: 1) took issue with the ICT for development discourse and suggested that the geographies of inclusion and exclusion created by the internet are more complex. Mercer revealed that for Tanzania's information and communication technologies (ICT) elites, the internet will shape the population into knowledge and market-seeking, productive citizens, stimulating national growth. However, for internet café users and non-users, the internet has become a marker of modernity, a way for people to indicate their relative level of development. Internet use is currently dominated by leisure, communication and information relating to global popular culture. Mercer demonstrated that development interventions, which turn the symptoms of poverty into technical problems to be solved with technological responses, are inherently flawed, since the failure to deal with the causes of poverty means that the majority of Tanzanians continue to be excluded from the "information society".

Mercer's (2005) findings indicate that the experiences with the use of ICTs and services provided by telecentres vary from one community to another. The findings show that not much has been done to investigate the extent to which ICTs impact various aspects in teaching and learning. The population in Mercer's study involved a total of 279 customers from the three internet cafés in Dar es Salaam and 265 customers from the internet café at the Sengerema Multipurpose Community Tele-centre all of whom completed open-ended questionnaires. In Sengerema, semi-structured interviews with customers and focus group discussions with non-customers were held and 299 town residents were interviewed to contextualize the questionnaire responses.

Vajargah, (2010) in the research titled as the application of ICTs in teaching and learning at university level concentrated on the obstacles, facilitators, and the risks of using these technologies in teaching and learning in higher education.

Hennessy (2010) synthesized the literature on uses of information and communications technology (ICT) in primary

and secondary schools in Sub-Saharan Africa, with a particular focus on Commonwealth countries and on East Africa. It focused on the role of ICT in improving the quality of learning and teaching in schools with reference to technologies. In so doing, the review provide new light on the supporting and constraining factors that influence ICT integration in education by prioritizing provision of initial and ongoing in-service teacher education that effectively equips teachers to integrate ICT into subject teaching and learning using contemporary pedagogical approaches.

In another study done by (Pigato, 2011) of Information and Communication Technology, Poverty, and Development in sub-Saharan Africa and South Asia focused on the relationship between ICTs and poverty, revealed that with respect to telephone lines, for example, there are only 14 and 19 telephone per 1000 inhabitants respectively in the two regions, compared with 69 in low and middle-income countries. Also for radio, television and telephone ownership registering 65%, 28% and 5% respectively for urban areas, compared with 38%, 5% and 18% respectively for rural areas.

The study on ICT Resource Utilization, Availability and Accessibility by Teacher Educators for Instructional Development in College of Education (Salau, 2008) indicated that there were no ICT resources in most of schools. This meant that no utilization, accessibility and availability of ICT.

Similarly, a study on “Access and Utilization of Information and Communication Technologies (ICTs) Among Agricultural Researchers and Extension Workers in Selected Institutions” in Nasarawa State of Nigeria (Dankaro, 2012), the findings revealed that researchers had 87% access to ICT facilities while extension workers had 66% access. On the level of utilization of ICTs for agricultural communication the researchers scored 84% while extension workers scored 70.3%.

These studies indicated that, ICT can enhance effective and efficient teaching and learning (Holsinger& Cowell, 2000; Schönwetter, Sokal, Friesen, & Taylor, 2002). However, in the Tanzanian context, studies addressing the extent of ICT utilization that directly linked it to enhancing effective and efficient teaching/learning among secondary school teachers and students are limited. This necessitated this study in order to fill this gap of knowledge that was revealed in reviewed literatures.

III. RESEARCH METHODOLOGY

A. RESEARCH APPROACHES

This study employed a mixed methods approach where both quantitative and qualitative research approaches were used. This study used both methods because it was considered that every research method has its limitations and its strengths’ (Seidman, 2006). Creswell and Clark (2007:5) explained that the use of quantitative and qualitative approaches in combination provides a better understanding of the research problem than when either approach is used alone. Mixed method research provides strength that offset the weaknesses of both quantitative and qualitative research. The use of both

paradigms in this research was carefully designed, so as to minimize the expense, the time consumption and the length of the entire exercise, as advised by Creswell (1994:7).

B. RESEARCH DESIGN

This study used a descriptive survey research design, because of the nature of the respondents required and the study itself. The studies under descriptive survey rely on individuals’ reports of their knowledge, attitudes or behavior (Creswell, 2011). They assess attitudes, opinion, demographic information, conditions and procedures (Ary, Jacobs & Razavieh, 2002), and data are usually collected through questionnaires, interviews or observation. This study employed descriptive survey design to gather data and give a picture of a real situation on the ICT utilization and its contribution in enhancing teaching/learning among teachers and students in Tabora Municipality. Fowler (2001) contends that survey design gives in-depth responses about what people think and how they feel about the problem.

C. TARGET POPULATION

The target population for this particular study comprised teachers and students of Milambo, Cheyo, Ipuli, Tabora girls’, and Chang’a secondary schools in Tabora municipality. These schools were provided with different ICT materials as sample schools here in Tabora region to enhance ICT in Tanzanian secondary schools and some of the teachers were given special training about ICT. In this study, a total of 122 students and 20 teachers were involved in this study. This study intended to find out how far this programme becomes useful to both teachers and students in their studies and to what extent was it implemented.

Respondents	Schools					Total
	Ipuli SS	Milambo SS	Chang’a SS	Tabora Girls’ SS	Cheyo SS	
Teachers	4	4	4	4	4	20
Students	24	26	24	24	24	122
Total	28	30	28	28	28	142

Source: Field Data (2014)

Table 3.3: Sample and the corresponding schools where was drawn (N=142)

D. SAMPLING PROCEDURE

Studies show that, there are various sampling techniques available to researchers depending on the design employed in the particular study (Cohen, Manion & Marrison, 2013). In this study, sampling was done by using simple random sampling to the students, in which a reasonable number of respondents that represent the target population were selected. In this kind of sampling a researcher can determine the probability that any element or member of the population will be included in the sample (Mugenda & Mugenda 2003: 45). The choice of this technique was made because there were so many secondary school students in the selected sample area that have an equal chance of providing information related to

this study while purposive sampling technique used to select teachers.

E. DATA ANALYSIS

Quantitative data were analyzed by using Microsoft office excel software (MS- Excel 2007) and Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics of mean and standard deviation were calculated in order to make inference of the findings. Qualitative data were analyzed using Thematic Analysis.

IV. DATA PRESENTATION, INTERPRETATION AND DISCUSSION

A. ACCESSIBILITY OF ICT TOOLS AT SCHOOLS

This section examines the accessibility of ICT tools to the selected secondary schools. Data from the students were collected through focused group discussion and questionnaires. Findings in this section show that (i) the available ICT tools were hardly accessed (ii) the schools had inadequacy of ICT facilities despite the fact that they are the most important tools in teaching any subject. The following sub-sections under specifically indicate the extent to which this was the major problem in all the schools visited. Table three indicates ICT accessibility at secondary schools as follows:

Items	Respondents	Strong Agree	Agree	Not decided	Disagree	Strong Disagree	Mean	Sd
The school is having ICT room	Teachers	3(15)	7(35)	4(20)	5(25)	1(5)	2.7	1.1
	students	35(28.7)	34(27.9)	1(.8)	19(5.6)	33(27)	2.8	1.6
Availability of enough computers at schools	Teachers	0(0)	1(5)	1(5)	7(35)	11(55)	4.4	.82
	students	14(11.5)	16(13.1)	9(7.4)	35(28.7)	48(39.3)	3.7	1.4
School Management/administration Support their Schools	Teachers	2(10)	6(30)	0(0)	7(35)	5(25)	3.3	1.4
	students	9(7.4)	35(28.7)	10(8.2)	27(22.1)	41(33.6)	3.4	1.4
ICTs storage and accessibility	Teachers	1(5)	13(65)	0(0)	6(30)	0(0)	2.5	1.0
	students	22(18)	33(27)	10(8.2)	28(23)	29(23.8)	3.0	1.4

Key: Value in table above represent frequency and percentage in brackets.

Source: Field Data (June, 2014).

Table 4.1.1: Availability of ICT rooms, computers, support and storage units (N=142)

a. AVAILABILITY OF ICT FACILITIES

It was noted that, most of the respondents agreed that ICT rooms were available to the few secondary schools but equipped laboratories were not available and there were no enough computers and teaching manuals to most of the secondary schools. Table 4.1.1 indicates that more than half of

the students (Mean=2.84, SD=1.63) were not sure that the schools had adequate ICT rooms to accommodate the students and teachers while teachers were also not sure of the availability of enough ICT rooms secondary schools (Mean=2.70, SD=1.17).

On the other hand analysis of data gathered from students and teachers via focused group discussion indicated that, ICT rooms were present in most of the schools but no enough ICT equipment. For example, one of the respondents had the following to say on the availability of rooms;

“Our school has no enough computers, scanners and projectors but they are kept in one of the class taken as the computer room [FGD with students and teachers held on 23/05/2014]

On the availability of enough ICT materials such as computers to accommodate the students and teachers irrespective of the availability of lack of laboratories, many students disagreed on the availability of the Teaching and learning materials to their schools. Findings presented in Table 4.1.1 indicate the disagreement among teachers (Mean=4.40, SD=.82) and students (Mean =3.71, SD=1.4) that computers were enough to their schools.

Similarly, findings from the focused group discussions revealed that computers were not enough to the secondary schools compared to the number of students present. During focused group discussion with some teachers, it was noted that they appreciated the few ICT tools available at their schools. For example, one of the teachers declared that:-

“The school is having 20 computers, only one modem for internet, one printer, one scanner, one flat screen (Smart TV) and only three projectors for the whole school. These are not enough to the number of students present at our school. Even though, we face a lot of challenges of not having a clear budget for buying modem-voucher and hence we stay with ought an internet for a long time. Sometimes electricity is a problem to implement the demand of the government“ [FGD teachers held on 26/05/2014]

Findings in Table 4.1.1 also indicated that teachers revealed that they were not sure if there was a support from the administration in enhancing ICT for teaching and learning in schools (M=3.35, SD=1.42). The same scenario was also shared by students (Mean=3.46, SD=1.4).

Focus group discussions with students also indicated this skepticism on the support from the school administration to improve ICT for teaching and learning. One of the students pointed this saying;

“Our school is not supported to develop ICT. This is due to the fact that only few computers and projectors are seen in hands of the teachers. It is difficult to us to speak on this”

This excerpt implies that without support from the higher authorities, ICT in schools would be a myth. Therefore, the findings were a revelation that school headmasters and mistresses were not supportive to their teachers and students.

The findings in this section generally show that the utilization of ICT for teaching and learning in school is not supported and therefore the technology has less contribution to students’ academic achievement and teachers’ pedagogical development. Focused group discussions with most of teachers can be summed by one quote that:-

Headmasters and Mistresses do not support us in any how to run this programme, since it is new and it needs much money, commitment and time. For example, when a teacher needs to go for further training you hear an administrator saying "whom do you think will cover your part? And still you do not meet the requirements put by the government, hence stay and teach" take time to think on this kind of response if it could be to you. [Focused Group Discussion with teachers held on 26/05/2014]

On the other hand students' responses would be summed up saying;

Heads do not support this programme, since it is new and it needs much money, commitment and time. For example, when a teacher is not well trained can teach to the extent of his/her knowledge only, so they can be taken to have several training and workshops. Also students have to be given enough time to deal with computers in particular than it is done. [Focused Group Discussion with students held on 26/05/2014]

b. ICT TOOLS' STORAGE AND ACCESSIBILITY AT SECONDARY SCHOOLS

On the storage and accessibility of ICT tools in secondary schools, it was noted that (i) students (Mean=3.07, SD=1.48) and teachers (Mean=2.55, SD=1.0) were not sure whether the ICT tools were well stored and (ii) teachers (Mean=4.40, SD=0.82) and students (Mean=3.71, SD=1.4) disagreed that ICT tools were accessible to students rather rarely to teachers. This was probably due to the fact that computers are not proportional to the number of students present at school.

Findings presented in Table 4.1.1 indicate that both students (Mean=3.07, SD=1.48) and teachers (Mean=2.55, SD=1.0) were not certain whether ICT materials were easily accessed from the storage rooms. Students' academic achievement is thus affected by poor accessibility of ICTs materials.

However, data collected through focused group discussion with teachers indicated that, ICT tools were easily accessible but were very few in most of the schools. One of the respondents had the following to say;

"Ok, it is true; let me say that, despite the fact that there are various teaching and learning materials, but ICT teaching/learning materials/tools are very few which are supposed to be used by teachers and students, some are not used because of the number of student in the class. For example, when teaching the class with 5 students, I am forced to use a table teaching method and focused group discussion, which are not effective or efficient in relation to projection of materials (ICT); though in so doing, we help the student to learn while seeing what is going on the board because we get the chance to access different ICT tools for more preparations and implementations" [Focused Group Discussion with some of the teachers held on 23/05/2014].

This excerpt indicates that the accessibility of ICT materials is also a question of adequacy of such materials in a given school. With this opinion from one of the teachers given, the general implication is that many teachers had access to ICT tools. In another FGD it was found that the schools had no laboratories, enough computers, modems, projection

boards, televisions, compact discs (CD's), speakers, projectors, and teaching manuals were stored in one of the selected classrooms. In addition, the storage facilities were not proper for keeping ICT materials mentioned above. One of the respondents argued on this saying that;

"This kind of storage is good but not the best area to store electronic materials, since classrooms have dust, no air conditioner and no carpets". [Focused Group Discussion with some of the students held on 24/05/2014]

Further analysis indicates that in schools where there were no computer laboratories; ICT tools were stored to the administration/headmasters office. The implication of this is that still students and teachers are facing a lot of challenges to access ICT tools which are stored to the offices.

c. DISCUSSIONS

Findings in this section showed that (i) only few ICT tools were present at schools and (ii) they were hardly accessed by students but rarely accessed by teachers from the area of storage (iii) most of the secondary school management/administration had no support to both teachers and students in facilitating ICT development. Availability and accessibility of ICT facilities including computer laboratories, computers, internet, modems, teaching and learning manuals, televisions, speakers, projectors, projection boards and compact discs (CDs) could lead to good integration of ICT in education. The one sided access to ICT tools was noted and was said to affect students' academic achievement as only teachers were close to the technology. These findings are in line with the results displayed by Dankaro (2012), that most of the teachers had 87% access to ICT facilities while students had 13% access to ICTs and that insufficient access to ICT was an obstacle preventing successful implementation of technology (Kay, 2006).

The findings that computer laboratories were not present, were available, and materials of the ICT were lacking, was an indication that the ICT tools were inevitable to be inaccessible. This in turn had diminishing returns to students' academic achievement. Inappropriate use of ICTs in schools as indicated in this study contradicts findings by Tinio (2002) that different ICTs were said to be helpful in expanding the access to education, strengthen the relevance of education and raise educational quality of education and helps to make teaching and learning into an engaging, active process connected to real life.

These findings are in line with the study done by Idoko and Ademu (2010) in an investigation of the challenges of ICT for teaching/learning as perceived by agricultural science teachers in 210 secondary schools from the three educational zones in Kogi State, also found that ICT facilities were not available and hardly accessed in secondary schools. Therefore, no access to ICT tools since some of the tools are not found in most secondary schools. Individual ICT' tools, like computers, modems and removable disks are frequently used in implementing this programme in most of the schools. Generally, the contribution of ICT to students' academic achievement is in hand to only teachers who have an access to ICT tools. Despite some of the schools visited had neither the official laboratories nor the working internet services, majority

of teachers always encouraged their students to read for their own from library and searching learning materials from the internet.

This study clearly indicates that without any good support from the higher authority, ICT cannot run well at the schools. It has revealed that most of heads of schools had poor support to their teachers and students. This implies therefore that neither teachers nor students are supported in implementing ICTs to their schools. If the management does not support it, nothing can be done in contribution to students' academic achievement and teachers' pedagogical development. It is also difficult to the teachers to cope with the new curriculum of competence based curriculum. There will also be lack of innovation in skills among teachers when it comes to teaching while the technology is changing daily.

The review provides new light on the supporting and constraining factors that influence ICT integration in education by prioritizing provision of initial and ongoing in-service teacher education that effectively equips teachers to integrate ICT into subject teaching and learning using contemporary pedagogical approaches and support (Pigato, 2011).

The theory underpinning this study is technological determinism theory which believes that technology shapes how we as individuals in a society think, feel, act, and how society operate as we move from one technological age to another (McLuhan, 1962). It is said that we learn, feel and think the way we do because of the messages we receive through the current technology that is available (Ibid). Due to the findings above, the theory and findings are not in line to what is done at secondary schools. Teachers and students do not act, feel and operate as the theory demands because of in accessibility of the ICT tools to them.

Also it was noted that ICT tends to expand access to education, for example, teleconferencing in the classrooms allows both learner and teacher to interact simultaneously with no difficulty and convenience (Fu, 2013). This is contrary to the findings obtained from the study. UNESCO (1990), indicated that, schools with no ICT tools have poor students academic performance since they are denied to ICT tools accessibility.

Finally the theory demands that students and teachers learn, feel and think the way they do because of the messages received through the current technology that is available. On this; the question comes how one can receive messages while ICTs are not in practice and use?

B. ICT UTILIZATION FOR TEACHING AND LEARNING IN SCHOOLS

This section presents findings on the examination of the extent to which ICT was being utilized in enhancing teaching/learning among teachers and students, specifically; the intention of this section explored the arrangement of time table in implementing ICTs effectively. Data was collected through focused group discussion and open ended questions of the questionnaires. Students and teachers were the sources of data. Findings in this study revealed that (i) Most of the computers were used by the administration than students (ii) No clear time table for ICT utilization in most of the schools

(iii) Teachers were poorly technological experienced (iv) Software necessary for teaching were kept and not utilized and (v) teachers were not aware on the changes on national ICT policy, curriculum and pedagogy.

a. SCHOOL TIMETABLE AND UTILIZATION OF ICT IN TEACHING AND LEARNING

Analysis of FGDs and OEQ data reveals that when the respondents were asked on hours per week do they spent interacting with ICT, neither students nor teachers knew the clear time table. They also pointed that the timetable on the ICT utilization at schools was not well arranged to suit the needs of both students and teachers. This was for example highlighted by one of the students who reported saying that; "We do not have the time table which demands us to undergo learning ICT".

In addition, more than 50% of the respondents declared that, there were no well-arranged time table to the schools that had IT as the lesson involving students and teachers. Only one school between all five schools found to have a clear defined time table in teaching only form one and form two alone.

b. TECHNOLOGICAL EXPERIENCES

Findings in this study revealed that respondents were evenly divided between those with access to and with no access to technology in practice. The technological experiences to teachers in implementing ICTs effectively differed within and across groups of teachers.

During Focus group discussions with teachers on technological experiences in teaching, some of them had this to say:

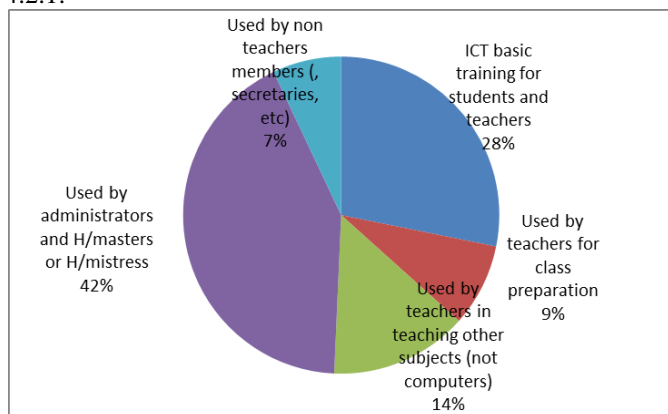
"You know! Most of us didn't study these computers in lower levels. Few of us only were taken for three weeks of training under the factor that, they studied science or English language in their professionalism. This does not signify the easiest understanding of the new technology to such extent." [Focused Group Discussion with teachers held on 27/05/2014]

During these discussions it was also revealed that most teachers were of the opinion that it was not good to involve only teachers with knowledge and background of science and English language to use ICT in teaching. This was supposed to involve all the teachers.

c. USABILITY OF ICTS IN SCHOOLS

Findings in this study also revealed that very few educational software were available at schools. It was suggested that the use of computers be for the basic ICT training (peripherals, operating system, office tools and internet). Though many schools indicated to use ICT for integration, the lack of specific software meant that either it was used only for basic ICT training, or that teachers use training materials they produces or downloads. In addition, findings revealed that despite few computers in schools, the utilization of ICT was as follows; heads of schools and administrators (42%), training students and teachers (28%), class preparation (9%), teaching other subjects other than computers (14%), basic ICT training (28%) and other

personnel such as secretaries (7%) as indicated in Figure 4.2.1:



Source: Field Data (June, 2014).

Figure 4.2.1: Statistics indicating Use of computers (N=142)

d. COMPETENCES IN ICT POLICY, PEDAGOGY AND CURRICULUM

Analysis of data in this section revealed that in recent years, there has been a shift from a content-based curriculum to a competence based one, requisite re-training of teachers to implement this has not been widely provided as noted prior. The curriculum requirements and the ICT policy requirements as guided by national policy papers have not been in tandem. The findings indicated that policy, curriculum and pedagogy to teachers were not in favour of ICT in teaching and learning. While discussing curriculum and policy issues, teachers noted that:-

“There are opportunities for ICT use in teaching and learning through accessing different materials using websites referenced in syllabus but nothing to deal with this due to the absence of ICT facilities.”[Focused Group Discussion with teachers held on 30/05/2014]

Over this opinion, the teachers indicated that different opportunities for implementing ICT can be achieved. When discussing pedagogy issues, one of the respondents said,

“I sometimes lose hope, due to that only few issues about computer I know, when it becomes to a technical issues nothing I can do”.[Focused Group Discussion with some of the teachers held on 27/05/2014]

In fact, it was noted that most of the ICT-teachers were not trained and rather had what was the so called “*crash programme on ICT*”. Nevertheless, teachers do apply their abilities and competences in dealing with this venture. Uses of ICT in pedagogical activities are widespread in the education system. Teachers use computer software to make lesson plans, PowerPoint presentations, and use smart boards for interactive lessons. Teacher technical mastery of ICT skills is not a sufficient precondition for successful integration of ICTs in teaching.

e. DISCUSSIONS

Findings in this section revealed that (i) no clear time table for ICT utilization in most of the schools (ii) most of the computers were used by the administration than students (iii) teachers were poorly technological experienced (iv) software

were kept and not utilized and (v) teachers were not aware on the changes on ICT policy, curriculum and pedagogy.

It is in this light that students and teachers had to use effectively the time given for the special case of ICT. Most of the schools had not clear indicated the ICT period on the master time table. This was due to the fact that most of the secondary schools had no lesson specifically for Information and Technology (IT). Only one school found to have this lesson to only form one and form two alone. Only other subjects were considered much in the time table. It was noted previously that to miss good arrangement of the time table leads to failure without knowing (URT, 2011). Under this, both teachers and students are supposed to follow the defined and stipulated time table for development.

Technological experiences; most of the teachers are not experienced much in the area of ICTs. This cannot bring any immediate change to the students’ minds since teachers are not well trained. Only few teachers were taken to have short training of only one month and being taken as qualified teachers of ICT and being taken to schools to teach. The aspect as who are expected to drive the new ICT advanced education system is brought afore due to experience. The advancement in which ICT resources offer in education can be evident through accessibility to quality resource materials, training and instructional delivery.

This can only be attained when it is drastically integrated into the instructional process in the teacher education system (Hennessy, 2010). Productive instructional delivery enhances learners’ creative and intellectual development through the use of ICT resources, for instance, in the use of multimedia images, graphics, audio, text and motion for high quality learning. It has been discovered that most of the computers were used by the administration. As the results imply, in anyhow, computers are used at schools. The problem here is that, they are used un intentionally in all aspects. To some schools computers were used to teach teachers and students basic knowledge of the computers but not applied on subject wise.

If this is attained much direct with the situation that most of ICTs are accessible only to teachers than students. School as an educational organization, the Headmaster is the leader of a school and the importance of strong leadership in effectively implementing ICT in education is evident from many of the country reports (Gosmire& Grady, 2007). Today’s rapid technological changing environment requires the headmaster and teachers as a technology leaders to become involved in discovering, evaluating, installing, and operating new technologies of all kinds, while keeping teaching and student learning as the guide and driving force behind it all (Gao, 2010). But the school headmasters are doing this either direct or indirect depending on the nature and type of management being employed there.

Through this, it is difficult to attain the good students’ academic achievement. There is a need to look in the other way around how these computers are used directly in some of the schools to avoid determinism theory acceptance. Though, a high number of schools indicated their ICT utilization as a danger of people embracing the “*technological determinism theory*” is avoided. They regard ICTs as a cure that could solve all development problems, with the understanding of the

local context of how they would be used at schools (Chacko, 2004; Long & Long, 1992; Moodley & Cloete, 2004). It is highly observed that ICT policy, pedagogical and curriculum competences are still challenging factors in implementing ICTs in secondary schools. The problem here is that in absence of curriculum in most cases cause the absences of syllabi in different aspects. To mean that teachers are not well educated on different changes of the curriculum of which changes in the syllabi later happened (Mercer's, 2005). It was simple issue to most of the teachers to view curriculum, but to move in line with the demand of the curriculum was seen as an issue. These results are directly inline into poor utilization of ICTs properly in enhancing the clear achievement to the students later. In connection to this, pedagogically, teachers are not fit due to the change of this curriculum and absence of ICT policies.

Others noted that, the use and preparation of teaching and learning materials through ICTs needs time which is not available due to shortage of ready students to learn and teachers to teach in secondary schools (URT, 2003). This shortage of teachers has resulted in heavy workloads for the few teachers in the schools. While others noted the challenges which may hinder ICT utilization that, absence of ICT institutional /school policies hinders each and every thing in the use of ICTs.

Findings in this study concur with the technological determinism theory which believes that technology shapes how we as individuals in a society think, feel, act, and how society operate as we move from one technological age to another (McLuhan, 1962). We learn, feel and think the way we do because of the messages we receive through the current technology that is available. The findings under this are that most of the computers were used by the administration than students, no clear time table for ICT utilization in most of the schools, teachers were poorly technological experienced, software were kept and not utilized and teachers were not aware on the changes on ICT policy, curriculum and pedagogy. Most of the computers were used by the administrators, this finding is in line with the study that administrators act and operate as they move from one technology to another age. The difference is that they do not consider the intention of the computers at their schools. But some of them were seen as they used computers to accomplish their needs in terms of the administrative works. No clear time table for implementing ICT, this finding is not in line with the theory of technological determinism due to that it does not consider how the time table has to be at schools. Teachers were poorly technological experienced, software were kept and not utilized and teachers were not aware on the changes on ICT policy, curriculum and pedagogy, actually these findings are in line with the theory due to that there is a danger of people impressing technological determinism theory which later may turn to society fragmentation. Lack of technological experiences brings up the solutions to the worry raised by the theory.

C. THE CONTRIBUTION OF ICT-UTILIZATION TO STUDENTS' ACADEMIC ACHIEVEMENTS

Findings on ICT utilization contribute on students' academic achievement revealed that (i) no direct influence to the students' academic achievement in terms of final results (ii) students do enjoy the lesson when ICT facilities were used and (iii) outside the classrooms ICTs contributed to mass failures academically.

a. THE INFLUENCE OF ICT ON STUDENTS' ACADEMIC ACHIEVEMENT

Analysis of focused group discussion, data gathered from teachers and students revealed that it was not easy to determine the influence of ICT in students' academic achievement given the circumstances around its utilization in schools. Revealing this one of the respondents said:-

"This programme started in 2012 when some of the teachers were shifted from one school to another and others in 2013 were given training. It is not easy to judge this programme simply its impact to students' performance is not well defined" [Focused Group Discussion with teachers and students held on 30/05/2014]

Considering the opinions given by many respondents, the school ICT programmes has no observable impact on students achievement like good results in their final examinations, rather appears to make students enjoy the lesson making many students to attend lessons than before. It was therefore revealed that ICT programmes were good but it needed more time to conclude whether were successful for teaching and learning objectives. In normal circumstances, students enjoy much when the teacher teaches any lesson through ICT tools, some students during the discussions said:-

"We enjoy much the lesson, we ask different questions, we can be told how to search materials and the class becomes interactive to all, but we face a lot of challenges like that of not learning computer itself due to shortage of computers at our school" [Focused Group Discussion with students held on 30/05/2014]

In fact this opinion matches with what the researcher observed when the students were discussing different issues concerning the utilization of ICT in schools. Students were eager to know how computers operate in their daily life specifically in academics. The problems being addressed by these students are really true under the findings indicated before.

Contrary to that, in one of the discussions with the students, it was noted that, some of them were failing in their continuing examination due to the presence and utilization of this technology. One of the respondents, said:

"Since I knew how to chat through face book, what's up, instagram, twitter, shazam, e-mail and viber, my progress in academic is going bad." (Discussion with students held on 30/05/2014)

This implies that ICTs bring about both positive and negative development to the students. Therefore, students have to be guided well and not to just embracing the technological theory. Due to this the contribution of ICT to students' academic achievement is ignored. It shows that there is a

danger of students embracing technological change in academics otherwise academic failing will be high. It is true that ICT contributes much to students' academic achievement like good performance and getting friends who can latter help them in sponsorships to higher levels of education and other related help, but good management is needed to avoid students from going astray to the intended needs.

b. DISCUSSIONS

This study found out that, the contribution of ICT utilization was not consistent with students' academic achievement in enhancing educational development. The findings revealed that there were no direct impact to the students' academic achievement in terms of final results, students do enjoy the lesson when ICT facilities were used and that outside the classrooms ICTs contributed to mass failures academically if used differently.

These findings are in line with the Technological Determinism Theory which believes that technology shapes how we as individuals in a society think, feel, act, and how society operate as we move from one technological age to another (McLuhan, 1962), students have something to learn in presence of this ICT to them. It was also noted that ICT tends to expand access to education, for example, teleconferencing in the classrooms allows both learner and teacher to interact simultaneously with no difficulty and convenience (Fu, 2013). Regarding this, it's true that ICT contributes to the development of students academically. The theory is in line with all findings obtained in the sense that, to the students who failed because of this technology had accepted all messages received through ICT and failed to integrate into real life situation. Also students who became happy due to the presence of ICT had accepted determinism theory and taken into other way for their success, though it might be because it was new issue to them. Finally, ICTs have positive impact and negative impact to the students.

While it was said that in year (2012-2013), ICT tools were distributed to some of the secondary schools. These tools were expected to arouse students' academic enjoyment in how the lessons were planned and taught and was thought to motivate them going to school regularly (specifically, ward secondary school students).while the focus is on students to enjoy the lesson, we also need to remember that the uses of ICT in education are many depending with the description and therefore control on its out of school utilization needs control. The following are uses of ICT described with the functions; ICT as object by referring learning about ICT; ICT as an 'assisting tool' while making assignments, collecting data and documentation, communicating and conducting research; ICT as a medium for teaching and learning; and ICT as a tool for organization and management in schools (Cuban, 2002; Davis et al., 2009; Dexter, 2002; Divaharan& Ping, 2010). These four dimensions are foremost in the educational system that's why students do enjoy the lesson.

D. THE CHALLENGES FACING ICT IN TEACHING/LEARNING AT SECONDARY SCHOOLS

This section presents and analyses findings on the challenges facing ICT in teaching /learning ICT in secondary schools. Specifically, it analyses challenges facing utilization of ICT in enhancing teaching/learning among teachers and students in Tabora municipality. Data from the teachers and students were collected through focused group discussion and survey questionnaires. Table 4.4.1 summarizes findings from the questionnaire study as challenges highly prevalent in most of secondary schools.

Challenges Facing ICT in Teaching	Respondents	Strongly Agree	Agree	Not decided	Disagree	Strongly Disagree	Mean	Standard Deviation
Lack of Internet - Connected Computers	Teachers	6(30)	13(65)	00(00)	1(5)	0(00)	1.40	.60
	Students	40(32.8)	68(55.7)	00(00)	10(8.2)	4(3.3)	1.59	.78
Insufficient Internet Speed	Teachers	7(35)	8(40)	00(00)	4(20)	1(5)	1.90	.91
	Students	35(28.7)	66(54.1)	00(00)	16(13.1)	5(4.1)	1.67	.86
Lack of adequate Skilled Teachers	Teachers	6(30)	8(40)	00(00)	5(25)	1(5)	1.95	.94
	Students	56(45.9)	50(41.0)	00(00)	11(9.0)	5(4.1)	1.76	.78
Lack of Training Support to Teachers	Teachers	16(80)	3(15)	00(00)	1(5)	1(5)	1.90	.45
	Students	51(41.8)	64(52.5)	00(00)	5(4.1)	2(1.6)	1.61	.69
Communication Barrier Between Teachers and Students	Teachers	8(40)	8(40)	00(00)	4(20)	00(00)	1.75	.72
	Students	53(43.4)	46(37.7)	00(00)	19(15.6)	3(2.5)	1.85	.83
Difficult to Implement Competence based curriculum (Current curriculum)	Teachers	5(25)	11(55)	00(00)	3(15)	1(5)	1.80	.77
	Students	0(00)	00(00)	00(00)	00(00)	00(00)	0.00	.00

Key: Value in table above represent frequency and percentage in brackets.

Source: Field Data (June, 2014)

Table 4.4.1: Challenges facing ICT in teaching at secondary schools (N=142)

a. THE CHALLENGE OF COMPUTERS AND INTERNET CONNECTION

Results in table 4.4.1 show that, majority of teachers (Mean=1.55, SD=1.0) and (Mean=1.26, SD=.85) of the students agreed on insufficient number of computers and lack of computers connected with the internet (Mean=1.40, SD=.60) and (Mean=1.59, SD=.78) were indicated by teacher and students respectively as the challenge in implementing ICT at secondary schools. This implies that many teachers had neither computers nor connection to the internet, thus were automatically lacking internet.

When FGDs data were analyzed, it was revealed that teachers and students were facing the same challenges and the same problems of not having enough computers being connected to the internet in schools. Teachers with personal computers use their own modems to access what they need

from the internet. This is unfortunately very difficult to many students to afford as ICT materials are expensive to them. In one of the FGDs on problems/ challenges facing ICT utilization in secondary schools, the common answers was ;

"Lack of computer laboratories, lack of computers and lack of enough funds (buying voucher for the modem is a very challenging situation to accomplish the pre- determined goal for ICT utilization".[Focused group discussion on 30th June, 2014]

b. THE CHALLENGES OF SKILLED TEACHERS AND THEIR SUPPORT

Findings in Table 4.4.1 also most teacher (Mean=1.95, SD=.94) and students (Mean=1.76, SD=.78) were of the opinion that there were few teachers with skills to use and teach using computer; similarly, most of the teachers lack (pedagogical) training support from administration (Mean=1.90, SD=.45) and (Mean=1.61, SD=.69), communication barrier (Mean=1.75, SD=.72) and (Mean=1.85, SD=.83) and difficult to implement competence based curriculum (current curriculum) respectively. Coupled with the shortage/lack of pedagogical support to teachers, lack of adequate ICT teaching and learning materials was still a great challenge too.

Analysis of data from FGDs with teachers indicates that, they face a problem of being not understood by the students. When discussing challenges facing ICT utilization in secondary schools, they commonly answered that:-

"We have been facing a lot of challenges, including irregular flow of electricity, network problems, and lack of computer laboratories, lack of enough funds (buying voucher for the modem), communication barrier and teachers being not understood. Most of the teachers of ward secondary schools are not subjected much to the use of computers."[Focused group discussion on 30th June, 2014]

This excerpt as was commonly indicated by many teachers suggests teachers are still facing different challenges in using ICTs for teaching in secondary schools. This also suggests that the contribution of ICT utilization to students' achievements is yet to be achieved. In addition, most schools involved in this study had common issues which inhibited the utilization of ICT materials (regular electricity, network, computer laboratories) implying that the technology poorly used in the attainment of the students' academic performance. Further discussions also revealed that majority of teachers noted in the present study that, use of this ICT in secondary schools has been a result of curriculum shift as noted previously. However, teachers had been failing to integrate previous curriculum to competence-based. The general implication to the findings above, teachers had no doubt on the problems presented for discussions and with the questionnaire. In so saying ICT problems are widely to all schools visited under study. There is a need to find out the solutions which may be clear to all students and teachers. In connection to students' academic achievement via ICT, it will continue to lag behind day to day if these computers; networks and teachers to be trained are not accomplished.

During the FGDs with students, most of them explained many challenges including those of which are only related to

the present ICTs. All in all, the students commonly argued that:

"There is a problem here, we just hear about ICT but no implications that are taking place to contribute to our performance"

Under this opinion, it shows that teachers are not participating fully to implement their duties of educating students through ICTs. Over all students are not satisfied with how ICT is being implemented in their schools. If this is the case, it shows that less or no contribution to academic achievement.

c. DISCUSSIONS

Findings in this study indicated that challenges facing ICT in teaching /learning ICT at secondary schools are many and that ICT has no contribution to teaching and students learning. It was revealed that insufficient number of computer problems, lack of internet connected computers and access speed, lack of adequate skilled teachers, lack of management support, communication barrier between teachers and students and the problem of curriculum implementation from content based to competence based one, were the major challenges to ICT implementations to most secondary schools. With this, schools are lagging behind to implement the programme.

In the study done by Nielinger (2003) found that ICT utilization faced many challenges. Some of these were widespread poverty, lack of skills and scarce resources. Nielinger pointed out that building the necessary infrastructure and covering the running costs, especially of connectivity, puts much higher burden on communities than on ICT users. This study done by Nielinger is in line to the current findings on lack of adequate skilled teachers. The observation on these results is that, if teachers do not understand each other with the students in terms of language, may be switch coding should be implemented to adhere to the students' needs. Otherwise students will continue not understanding what is taking place in the class. The researcher agrees with this, since ward secondary students were poorly organized in terms of English language fluent. Evidence indicated that, to utilize ICT in teaching/learning and increasing student's participation (with high skills levels) in the lesson, a teacher needs to mix language so as to be understood well (MoEVT, 2011). This was because most of the students that teachers had been teaching were form ones and form two's. Although some of the higher classes there is a great problem in case of English language. Basing on Technological Determinism Theory (McLuhan, 1962), these challenges provide evidence-based conclusions that that technology shapes how we as individuals in a society think, feel, act, and how society operate as we move from one technological age to another. It is now seen that challenges are not in line with the demand of the theory. Also the theory describes that we learn, feel and think the way we do because of the messages we receive through the current technology that is available.

E. SOLUTIONS TO THE CHALLENGES FACING ICT IN TEACHING/LEARNING AT SECONDARY SCHOOLS

This section presents findings on the possible solutions to the challenges facing ICT in teaching and learning at secondary schools in Tabora municipality. Several challenges had been addressed (Table 4.5.1) facing ICT in secondary schools including insufficient number of computers, lack of internet connected computers, lack of skilled teachers, lack of ICT tools accessibility; few materials were available at schools, lack of computer training and development to teachers, poor integration to current ICT curriculum, no clear time table to the students, policies, lack of laboratories, poor motivation to teachers, poor communication between the teachers and students, no administrative support on the issue of ICT and poor participation (truancy) of students were seen as a great challenge to them.

Solutions to Challenges Facing ICT in Teaching	Respondents	Strongly Agree	Agree	Not Decided	Disagree	Strongly Disagree	Mean	SD
Presence of Sufficient Number of Computers at school	Students	51(41.8)	66(54.1)	00(00)	3(2.5)	2(1.6)	1.52	.63
	Teachers	15(75)	4(20)	00(00)	1(5)	0(00)	1.60	.50
Availability of Internet - Connected Computers	Students	63(51.6)	54(44.3)	00(00)	4(3.3)	1(0.8)	1.63	.60
	Teachers	14(70)	4(20)	00(00)	1(5)	1(5)	1.85	.49
Presence of Internet Speed	Students	62(50.8)	52(42.6)	00(00)	7(5.7)	1(0.8)	1.65	.63
	Teachers	15(75)	4(20)	00(00)	1(5)	0(00)	1.85	.59
Availability of Adequate Skilled Teachers at school	Students	72(59.3)	48(39.3)	00(00)	1(0.8)	1(0.8)	1.63	.55
	Teachers	14(70)	4(20)	00(00)	1(5)	1(5)	1.85	.49
Provision of Support to the students to interact with the computer Adequate materials for teaching and learning	Students	64(52.5)	55(45.1)	00(00)	2(1.6)	1(0.8)	1.58	.57
	Teachers	15(75)	4(20)	00(00)	1(5)	1(5)	1.90	.69
Teachers should be taken for further training	Students	69(56.6)	50(41)	00(00)	2(1.6)	1(0.8)	1.62	.57
	Teachers	16(80)	3(15)	00(00)	1(5)	0(00)	1.90	.45
Motivation between teachers and students	Students	51(41.8)	64(52.5)	00(00)	5(4.1)	2(1.6)	1.57	.56
	Teachers	13(65)	5(25)	00(00)	2(10)	0(00)	1.80	.52
Learning manuals written in the language understood	Students	73(59.8)	48(39.3)	00(00)	1(0.8)	0(00)	1.52	.63
	Teachers	15(75)	4(20)	00(00)	1(5)	0(00)	1.58	.57
	Students	64(52.5)	56(45.9)	00(00)	1(0.8)	1(0.8)	1.58	.57
	Teachers	14(70)	5(25)	00(00)	1(5)	0(00)	1.85	.49

Source: Field Data (May, 2014)

Table 4.5.1: Solutions to Challenges Facing ICT in Teaching at Secondary schools (N=142)

a. ADEQUACY OF COMPUTERS, SKILLED TEACHERS, INTERNET AND SUPPORT TO ICT UNITS

Findings presented in table 4.5.1 indicate that most of the teachers and students suggested on the availability of enough

computers to both teachers and students (Mean=1.60, SD=.50) and (Mean=1.52, SD=.63), well skilled teachers (Mean=1.85, SD=.49) and (Mean=1.63, SD=.55) respectively. They also pointed that attention to these suggestions may direct bring about achievement to the students' academic performance and motivation in at all teachers and students (Mean =1.52, SD=.63) and (Mean =1.58, SD=.57) respectively. But, personal motivation is an important factor which forces members to improve their teaching methods and contribute to the learning of students by technological means (Medlin, 2001).

During focused group discussion with teachers the common answer to the issue of possible solution to the challenges facing ICT to secondary schools was:-

“Let me tell you, at our school we face a lot of challenges, but most of the problems indicated in previous are possible solutions in reverse. The way to mention the solutions, you need to know the problems as we had analyzed in previous question”

The findings imply that if clear solutions are obtained to the problems raised there, no need of finding other possible solutions on this, *“the problems are solutions in vice versa”* one said. Findings also imply that ICT can help students to achieve their needs if at all necessary conditions are attained. It is true that all solutions would mean that ICT utilization would contribute to advancement in students' academic performance.

b. DISCUSSION

As it is discovered in table 4.5.1, learning materials written in the language that is understood to the students can contribute to the students' academic achievement. With this reason, most of the responses indicate that self-motivation between teachers and students should be taken to facilitate learning to the students. The general implication of these findings is that, students and teachers the possible solutions suggested would be necessary to be obtained depending with the demand of the school, students and teachers for ICT to become very interactive and finally enhance performance to students. Lack of electricity is an example which clearly shows how the utilization of ICT in secondary schools is still a myth not only in Tabora but also in other places. Maintenance and support are also key areas that have to be considered in any of the project in order for the equipment to be maintained functional (URT, 2007)

In the context where there is low volume of computers per students as observed in the current study, the actual access of students and teachers to the ICT equipment for the purpose of teaching and learning in reality a practical rhetoric. Similarly, lack of specific educational software and other ICT tools indicates another form or practical rhetoric in computer usage to teach and learn the technical skills. These findings in this study are in line with previous reports that with severe limitations for the use of the tools to support training that make poor use of the tools (URT, 2011).

Finally, findings in this study are in line with theoretical underpinnings in this study which are based on Technological Determinism Theory which believes that technology shapes how we as individuals in a society think, feel, act, and how

society operate as we move from one technological age to another (McLuhan, 1962). The results of the possible solutions therefore assert that teachers will work hardly if all necessary materials proposed are present. This is due to that they act and feel happy if they are motivated and empowered with skills necessary for utilization of ICT in teaching and learning through further training.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

This chapter provides a summary of study approach, analysis procedures and the major findings of the study based on the specific research objectives stated in chapter one. It also gives a general conclusion and recommendations on findings of the utilization of information and communication technology (ICT) in teaching/learning among teachers and students and its contribution to students' academic achievement. In particular, the chapter opens an overview for further research on how ICT contributes to students' academic performance.

B. SUMMARY OF THE STUDY

Chapter one of this study established the purpose of the study which was to examine the extent that ICT is being utilized in teaching/learning in secondary schools and its contribution to students' academic achievement in Tabora Municipality. Specifically, the study aimed to investigate on: (i) the level of accessibility of ICT in secondary schools for enhancing effective and efficient teaching and learning in Tabora municipality; (ii) the extent to which ICT was utilized in enhancing effective and efficient teaching and learning among teachers and students in Tabora municipality; (iii) the contribution of ICT utilization on students' academic performance; (iv) the challenges of ICT that hinder enhancement of teaching/learning among teachers and students in Tabora municipality; and (v) the possible solutions to the challenges facing ICT in enhancing teaching/learning among teachers and students in Tabora municipality

Chapter two of this study reviewed literature indicated that, extensive study on utilization of ICT and its contribution to students' academic performance has been done worldwide. However, studies done to address the extent that ICT is utilized and how it contributes to students' academic achievement are very few. Furthermore, in Tanzanian context, studies addressing the extent that ICT is being utilized are very few, specifically, Tabora nothing have not yet been. In addition, literature review explained the role of ICT in education, policies and general availabilities.

Chapter Three presents the methodology used in this study. It describes strategies for sample selection, the sample and sample characteristics. It also described the process for data collection that is the approach and design, research instruments and procedures for data collection and analysis. It also discusses validity and reliability as well as ethical issues observed in this study.

C. SUMMARY OF THE MAJOR FINDINGS

The study has revealed that,

- ✓ Few ICT resources were available at schools. They were easily accessed by teachers only under the rules and regulations (by laws) put by individual school having a computer room, vice versa to the students who were not able to access the resources.
- ✓ More than 42% of the schools, ICT tools (like computers) were used by the administration (headmasters/mistresses), 14% used by teachers in teaching other subjects and only 9% for the classroom preparations.
- ✓ The few resources available were mostly utilized by science teachers than social science teachers in preparations of the lesson plan, scheme of works, lesson notes and teaching in the class.
- ✓ Lack of clear time table had been a way forwards to negative implementation of ICT in most schools
- ✓ Lack of school planning and development strategies for ICT use in general and in teaching /learning of curriculum subjects specifically in secondary schools had created a ripple effect in the areas of policy, curriculum, infrastructure acquisition, use and maintenance and professional development
- ✓ Including irregular flow of electricity, network problems, lack of computer laboratories, lack of enough funds (buying voucher for the modem), communication barrier and in fact most of the teachers of ward secondary schools were not subjected much to the use of computers.
- ✓ ICT contributed to students attendance to increase (ward secondary schools) since students do enjoy the lesson when ICT facilities were used.
- ✓ No direct impact to the students' academic achievement in terms of final results
- ✓ Outside the classrooms ICTs contribute to mass failures academically if used differently.
- ✓ The information collected revealed that insufficient number of computer, lack of internet connected computers and access speed, lack of adequate skilled teachers, lack of management support, and the problem of curriculum implementation from content based to competence based one, are major challenges to ICT implementations to most secondary schools.

D. CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

- ✓ ICT availability and accessibility often has been one of the most important obstacles to technology adoption and integration in learning, there is urgent need for more computers if a country is to successfully integrate ICT in public secondary schools
- ✓ Personal motivation is an important factor which forces teachers to improve their teaching methods and contribute to the learning of students by technological means.
- ✓ Utilization of ICTs can contribute positively or negatively to the students' academic achievements
- ✓ Tanzania would support itself to attain creativity, innovativeness and a high level of quality education in

order to respond to development, challenges and effectively competence regionally and internationally

- ✓ When used appropriately, different ICTs are said to be helpful in expanding the access to education, strengthen the relevance of education to the increasingly digital workplace and raise educational quality of education and helps to make teaching and learning into an engaging, active process connected to real life.

E. RECOMMENDATIONS

This section points out the recommendations based on the findings and the conclusion drawn in this study. It highlighted several issues that needs attention and hence needs to be addressed in order to enhance the effectiveness of teaching and thus be able to implement ICT in secondary schools based teaching and learning. In this section two categories of recommendations are addressed; namely, recommendation for action and recommendation for further studies.

a. RECOMMENDATIONS FOR ACTION

Based on the findings in this study, teachers and students' utilization of ICT for teaching and learning respectively is clearly minimal and seldom. Thus, it is recommended that, heads of schools should support and promote ICT at their schools. The findings revealed that most of the ICT teachers are not competent in teaching through ICT tools. It is now recommended that government through the Ministry of Education and Vocational Training should orient and train more teachers to ensure that ICT secondary school teachers have the capabilities of implementing the competence-based curriculum. Furthermore, as literatures indicated the weaknesses in the present curriculum and ICT policy in most schools, then, there should be efforts to implement the research findings on the area of curriculum development and implementation provided by various government institutions. Finally, ICT materials should not be closed in the Headmasters'/mistresses' offices.

REFERENCES

- [1] Adeoyeet.al. (2010).Adoption and Utilization of Information Communication Technologies among Families in Lagos, Nigeria.(IJCSSE). International Journal on Computer Science and Engineering, Vol. 02, No. 07, 2010, 2302-2308.
- [2] Ary, D. Jacobs, L.C.,&Razaieh, A. (2002).Introduction to research in education (6th ed.). Belmont, CA: Wadsworth/Thomson Learning.
- [3] Ayers, C., et al. (2002). Integrating Instructional Technology: in the California Community Colleges. Available at: www.rpgroup.org/cssweb/ Accessed 3/12/2013.
- [4] Ayo CK (2001). Information Technology Trends and Applications in Science and Business. Concept Publications, Lagos.
- [5] Babbie, E. (2005). The basics of social research (3rd ed.). London:Thomson Wadsworth.
- [6] Benjamin, P. &Dahms, M. (1999).Background paper on universal service and universal access issues. <<http://cbdd.wsu.edu/edev/edp/benjamin-dahms-1999.pdf> (Accessed 10 October 2013).
- [7] Blaxter, L., Hughes, C. & Tight, M. (2001).How to research. 2nd ed. Buckingham: Open University.
- [8] Boud, D., Cohen, R., & Walker, D. (2000). Understanding learning from experience. In D. Boud, R. Cohen & D. Walker (Eds.), Using experience for learning Milton Keynes: SRHE/Open University Press).
- [9] Broom, A. (2006). Ethical issues in social research. Complementary Therapies in Medicine, 13(1), 151-156.
- [10] Bryman, A. (2012). Social Research Methods (4th ed.). Oxford: Oxford University Press.
- [11] Chai, C. S., Hong, H. Y., &Teo, T. (2009). Singaporean and Taiwanese pre-service teachers' beliefs and their attitude towards ICT: A comparative study. The Asia-Pacific Education Researcher, 18(1), 117-128.
- [12] Chilimo, W. (2008).Information and Communication Technologies and Sustainable livelihoods: a case of selected rural areas of Tanzania. University of KwazuruNatal. Commission National printing company, Dar es salaam.
- [13] Cox, A. (1997).“Using the World Wide Web for library user education: A review article”, Journal of Librarianship and Information Science, 29 (1), 39-43.
- [14] Creswell, J. W. & Clark, V. P. (2007).Designing and conducting mixed methods research. Thousand Oaks: Sage Publications Inc
- [15] Creswell, J. W. (1994). Research design: qualitative and quantitative approaches. Thousand Oaks: Sage.
- [16] Creswell, J. W. (2003). Research design: qualitative, quantitative and mixed methods approaches. 2nd ed. Thousand Oaks: Sage Publications Inc.
- [17] Creswell, J. W. (2011). Research design: qualitative, quantitative and mixed methods approaches.3rd ed. London: Sage Publications Inc.
- [18] Creswell, John W. (2012). Educational research: planning, conducting, and evaluating quantitative and qualitative research (4th ed.). Boston: Pearson.
- [19] Cuban, L. (2002) Oversold and Underused: Computers in the Classroom. Cambridge MA: Harvard University Press.
- [20] Cuckle, P., Clarke, S. & Jenkins, I. (2000).Students' information and communication skills and their use during teacher training. Journal of Information Technology for Teacher Education, 9(1), 9-22.
- [21] Currier, S., Brown, S. &Ekmekioglu, F. C. (2001).Inspiral Project final report. Available at: <http://inspiral.cdlr.strath.ac.uk/documents/documents.html>
- [22] Dangwal, R. & Mitras, S. (1999). Learning styles and perception of self. International Education Journal, 1 (1), 61-71.
- [23] Davis, N., Preston, C., & S, ahin, I. (2009). ICT teacher training: Evidence for multilevel evaluation from a national initiative. British Journal Educational Technology, 40(1), 135-148.
- [24] Dexter, S., & Riedel, E. (2003). Why improving pre-service teacher educational technology preparation must

- go beyond the college's walls. *Journal of Teacher Education*, 54(4), 334–346.
- [25] Dexter, S., Seashore, K. R., & Anderson, R. E. (2002). Contributions of professional community to exemplary use of ICT. *Journal of Computer Assisted Learning*, 18(4), 489–497.
- [26] Divaharan, S., & Ping, L. C. (2010). Secondary school socio-cultural context influencing ICT integration: A case study approach. *Australasian Journal of Educational Technology*, 26(6), 741–763.
- [27] Doering, A. Hughes, J. & Huffman, D. (2003). Preservice teachers: Are we thinking with technology? *Journal of Research on Technology in Education*, 35(3), 342–361.
- [28] Edwards, S. et al., (2006). The assignment that triggered change: Assessment and the relational learning model for generic capabilities. *Assessment & Evaluation in Higher Education*, 29 (2), 141-157.
- [29] Ezeoba, K. O. (2007). Instructional Media. An Assessment of the Availability, Utilization and Production by Nursery School Teachers. *Journal of Applied Literacy and Reading*.3 (Special Edition) 33-38.
- [30] Fakeye, D. O. (2010). Assessment of English Language Teachers' Knowledge and Use of Information and Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State. *American-Eurasian Journal of Scientific Research*.5 (4).56-59.
- [31] Fu, J.S (2013). ICT in Education: A Critical Literature Review and Its Implications. National Institute of Education, Singapore. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 2013, Vol. 9, Issue 1, pp. 112-125
- [32] Gao, P., Wong, A. F. L., Choy, D., & Wu, J. (2010). Developing leadership potential for technology integration: Perspectives of three beginning teachers. *Australasian Journal of Educational Technology*, 26(5), 643–658.
- [33] Gev, Y. (1995). ISE – Information System in Education. In H. Barta, B., Telem, M., & Gev, Y (Eds.). *Information Technology in Educational Management* (46-47). London: Chapman & Hall.
- [34] Gosmire, D., & Grady, M. (2007). A bumpy road: Principal as technology leader. *Principal Leadership*, 7(6), 17–21.
- [35] Grove, K., Strudler, N., & Odell, S. (2004). Mentoring toward technology use: Cooperating teacher practice in supporting student teachers. *Journal of Research on Technology in Education*, 37(1), 85–109.
- [36] Guerrieri & Padoan (2007). Evaluation Models and Tools for Assessment of Innovation and Sustainable Development at the EU Level. *Modelling ICT as a General Purpose Technology*
- [37] Hadjithoma-Garstka, C. (2011). The role of the principal's leadership style in the implementation of ICT policy. *British Journal of Educational Technology*, 42(2), 311–326.
- [38] Hare, H. (2007). *Survey of ICT in Education in Tanzania*. Washington, DC: infoDev/World Bank.
- [39] Holsinger, D. B. & Cowell, R. N. (2000). Positioning secondary school education in developing countries: Expansion and curriculum. Paris: UNESCO-IIEP.
- [40] Hoque, K.E, Razak, A.Z & Zohora, M (2012): ICT utilization among school teachers and principals. Faculty of Education, University of Malaya, Kuala Lumpur, Malaysia
- [41] Hunter- Boykin it & Evans V.(1995). The relationship high school principals leadership, and teachers morale, *journal of instructional psychology* 22 (2) 152-162
- [42] Huntly, H. (2003). Beginning teachers' conceptions of competences. Published doctoral dissertation. Central Queensland University. Sydney: Australia.
- [43] ICC (2002). The Impact of Information and Communications Technologies on the Teaching of Foreign Languages and on the Role of Teachers of Foreign Languages a report commissioned by the Directorate General of Education and Culture.
- [44] Idoko, J. A. & Ademu, A. (2010). The Challenges of Information and Communication Technology for Teaching –Learning as perceived by Agricultural Science Teachers in Secondary Schools in Kogi State. *Journal of Educational Innovators*.3 (2).43-49.
- [45] Intven, H. & Tetrault, M. (2002). *Telecommunication regulation handbook*. Washington DC: Info Dev. <<http://www.infodev.org/content/library/detail/842>> (Accessed 14 Nov. 2013).
- [46] Kaplowitz, J. & Contini, J. (1998). "Computer-assisted instruction: is it an option for bibliographic instruction in large undergraduate survey classes?" *College & Research Libraries*, 59(1), 19-27.
- [47] Kargiban, A. Z. & Siraj, S (2009). The Utilization and Integrating of ICT in Chemistry Teaching in Iranian High Schools. Department of Curriculum, University of Malaya, Kuala Lumpur, Malaysia. *World Applied Sciences Journal* 6 (11): 1447-1456, 2009
- [48] Komba, D. (2001). Changing role of the teacher in the information age. *HURIA: The Journal of the Open University of Tanzania*, 3(2), 53-66.
- [49] Lever-Duffy, J & McDonald, J. (2008). *Teaching and Learning with Technology*. (3rd ed.) Boston: Pearson Education, Inc.
- [50] Makwetta J.M (1982). Ripotiya Mapendekezoya Tume ya Raisya Elimu. Juzuuyai. Dar-es-salaam, Jamhuriya Muunganowa Tanzania
- [51] Mbunda F.L (1996). Inside a Primary School Classroom in Tanzania. In *Papers in Education and Development*, vol. 17, 27-38pp
- [52] McLuhan, M. (1962). *The Gutenberg Galaxy: The making of Typographic Man*. Toronto: University of Toronto Press.
- [53] McMillan, J. H. & Schumacher, S. (2006). *Research in education: Evidence based inquiry*. New Jersey: Pearson Education Publishers.
- [54] Meera, S.N; Jhamtani, A; and Rao, DUM (2004) *Information and Communication PAT 2008*; 4 (2): 1-11 ISSN: 0794-5213; Salau E. S. and Saingbe N.D; Access and utilization of ICTs... 8

- [55] Mercer, C. (2005). Telecentres and transformation: modernising Tanzania through the internet. *African Affairs* 105(419): 243-264.
- [56] Ministry of Higher Education (2010). Tenth Malaysia Plan: 2010–2015, Putrajaya: Ministry of Higher Education (MOHE). Malaysia.
- [57] MoEVT (2014). National Programme of Information and Communication Technology (ICT) for Secondary School Teachers. Potential of information and communication technology (ict) held in Mwanza for the continuing training to the In Service teachers.
- [58] Mugenda, O. M. and Mugenda, A. G. (2003). Research methods: quantitative and qualitative approaches. Nairobi: African Centre for Technology Studies (ACTS) Press.
- [59] Murray, T. (1999). An Evaluation of the implementation of the dimension of learning program in an Australian independent boys' school. *International Education Journal*, 1 (1), 45-60.
- [60] Nagel, D. (2007). Research: Students actually use the Internet for education.
- [61] NICI (2011). Accelerating Service Development Rwanda ICT Strategic and Action Plan (NICI III – 2015)
- [62] Nielinger, O (2003). ICT-utilization of Small and Medium Enterprises (SME) in Tanzania.
- [63] Nielinger, O. (2003). Rural ICT utilisation in Tanzania: empirical findings from Kasulu, Magu, and Sengerema. <<http://www.duei.de/iak/de/content/forschung/pdf/projektnieltext6.pdf>> (Accessed 01 January 2014)
- [64] Pigato, M.A (2011). Information and Communication Technology, Poverty, and Development in sub-Saharan Africa and South Asia. Africa Region Working Paper Series No. 20.
- [65] Popkewitz, T. S. (2000). The denial of change in educational change: Systems of ideas in the construction of national policy and evaluation. *Educational Researcher*, 29(1), 17–29.
- [66] Rader, H. B. (2000). Library instruction and information literacy. *Reference Services Review*, 28 (4), 378-400
- [67] Schönwetter, D. J., Sokal, L., Friesen, M & Taylor, K. L. (2002). Teaching Philosophies Reconsidered: A Conceptual Model for the development and evaluation of teaching philosophy statements. *International Journal for Academic Development*, 7(1), 83-97.
- [68] Seidman, I (2006). *Interviewing as Qualitative Research: A guide for Researchers in Education and Social Sciences*: New York: Teachers College press
- [69] SIDA (2005). ICTs for poverty alleviation: basic tool and enabling sector. Greenberg ICT services: Swedish International Development Co-operation Agency. <<http://www.eldis.org/fulltext/sidaictpoverty.pdf>> (Accessed 12 October 2013).
- [70] Tapscott, D. (1998). Growing up digital: the rise of the Net generation. New York: McGraw Hill, p. 142.
- [71] Teddlie, Charles, & Tashakkori, Abbas. (2009). Foundations of mixed methods research: integrating quantitative and qualitative techniques in the social and behavioral sciences. London: SAGE.
- [72] Tella, a., et al (2007). An Assessment of Secondary School Teachers Uses of ICTs: Implications for Further Development of ICT's Use in Nigerian Secondary Schools. *The Turkish Online Journal of Educational Technology*, 6(3), 12.
- [73] Thomas, J, & Nelson, J. (2001). *Research Methods in Physical Activity* (4th ed.). Illinois: Human Kinetics.
- [74] Tinio, V.L (2002). *ICT in education*. New York. America.
- [75] Trochim, W. M. K. (2001). *Research methods knowledge base*. 2nd ed. Cincinnati: Atomic Dog Publishing.
- [76] UNDP (2001). Human development report: making new technologies work for human development. New York: United Nations Development Programme. <<http://www.undp.org/hdr2001>> (Accessed 02 Nov. 2013).
- [77] UNESCO (2006). *ICTs and Education Indicators: Suggested core indicators based on meta-analysis of selected International School Surveys*. Québec, Canada
- [78] UQ. (2002). What is ICT?. Retrieved November 13, 2013, from http://study.itee.uq.edu.au/degree_programs/BInfTech/what_is_ICT.htm
- [79] URT. (2005). The Tanzania Development vision 2025. The president office Planning
- [80] URT. (2007). Ministry of Education and Vocational Training (MoEVT), information & communication technology (ICT) policy for basic education in Tanzania.
- [81] Vajargah, K.F. et al (2010). Application of ICTs in teaching and learning at university level: the case of Shahid Beheshti University. *The Turkish Online Journal of Educational Technology – April 2010, volume 9 Issue 2*.
- [82] Viswathan, T (1992). *Telecommunication Switching Systems & Networks*. Prentice-Hall
- [83] Wanyambi, G.N.W (2002). Improving ICT Management in Public Universities in Kenya
- [84] Wentworth M. (1990). Developing staff morale, the practitioner 16 (4) principal leadership and teacher morale, the purdue teachers opinionare research morale, foundation.
- [85] Young, S. F. (2008). Theoretical framework and models of learning: tools for developing conceptions of teaching and learning. *International Journal for Academic Development*, 13 (1), 41-49.