



ICT APPLICATION IN TEACHING AND LEARNING PROCESSES BY TUTORS: A CASE OF TWO SELECTED TANZANIA TEACHERS COLLEGES (TCs)

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Abstract

Teachers Colleges particularly in developing countries such as Tanzania have been applying Information and Communication Technology (ICT) in teaching and learning process without much consideration of the actual needs, implementation strategies and limited or poor information infrastructure towards ICT application. This paper scrutinized the extent of application of Information and Communication Technologies in Teaching and Learning processes by Tutors in teachers colleges in Mara Regions in Tanzania. A total of 46 respondents selected through simple random approach from two teachers colleges were used to solicit the information regarding ICTs application. The data regarding the study was collected mainly through questionnaire being supplemented with interview guide questions, observation and documentary review. The data were analyzed descriptively using mean, frequencies and standard deviation. The study found large extent of ICTs application by tutors although its application is not efficient despite the roles ICTs can play in education.

Key words: *ICT, Application, Teaching, Tutors, Learning.*

1.0 Introduction

Information and Communication Technology (ICT) has been a principal driver of education development worldwide (Anderson, 2002). In many countries, the need for ICT in education development and particularly in curriculum implementation is used to justify the social and economic investments in a certain country (UNESCO, 1998). It is observed that ICT plays a major role in all aspects of curriculum implementations especially in teaching and learning activities within educational institutions in general and particularly in Teachers Colleges (TCs) (Avlos, 1985). On the other hand, ICT has the potential in increasing the efficiency and effectiveness of management and administration of TCs (Ayodo, 2009). ICT has indeed more impact on administrative services such as admissions, registration, fee payment and purchasing than on the fundamentals of classroom teaching and learning in TCs (Blurton, 1999). In addition to that, Bof (2004) mentioned among other things the application of ICT in TCs as productivity enhancement of teaching and learning activities in which ICT act as a main tool. It is observed that ICT issues have quickly moved from being special for preparing individuals to become ICT specialists into an issue and an important aspect in teachers' preparation so as to fit in their daily teaching activities (Göktaş et al, 2009). It is evident that most countries in the world have integrated ICT in their educational system in general and particularly in TCs (UNESCO, 2003).

2.0 Background of the Study

The application of ICT in developing countries like Tanzania is considered to be necessary in order to overcome the challenges related to poor curriculum implementation (Resta, 2002). The potential of ICT in education can be unlocked through pedagogical application of ICT in education, that is, when ICT are used as tools in teaching and learning activities. In this regard, UNESCO (2003) explained that the pedagogical applicability of ICT is concerned essentially with more effective learning and with the support of the various components of ICT. Pedagogical application of ICT involves effective learning with the aid of computers and other information technologies, serving the purpose of learning aids. According to Daft et al (1984) the potential of information and communication technologies in enhancing teaching and learning can only be realized when the technologies have been well and appropriately adopted and integrated in the pedagogical process in the TCs. The study by Issa (2008) shows that, available ICT infrastructures are not used primarily for classroom teaching in TCs in Tanzania. According to Hare (2007), most schools in urban areas already use ICT; however, in most cases ICT has not been integrated as a medium of instruction. In many developing countries like Tanzania, the potential of ICT to support pedagogy is yet to be fully realized.

The studies on the application of ICT on tutors' attitudes, perception and performance of students in the world and Tanzania particular have been conducted. For example the study conducted by Goktas (2009) on ICT uses on teacher educators ICT competencies, usage and perception in Russia revealed that, ICT motivates students to learn effectively and efficiently. In addition, Atkins (2003) affirms that the use of ICT in any given education institution assists students to develop deeper understanding of concepts by engaging them in active learning practices. Fitzpatrick (2004) scrutinize that technology in education may promote new learning environment in which enquiry and problem solving increase student achievement. To integrate the ICT in educational system, different strategies have been deployed in the western countries. Turkey through a Computer-Aided Education (CAE) Project computers were first introduced to Turkish education institutions in general and particularly in TCs which took shape between 1984 and 1986 (Ozar & Askar, 1997).

The aims were to spread computer literacy and the use of computers as one tool to compensate for the poor quality and persistent deficiencies of suitable teachers (Yedekcioglu, 1996). Also, the government upgraded the curricula and instructional materials, revising student achievement tests, improving the teacher training system, and increasing the research component in TCs (Schware & Jaramillo, 1998). Furthermore, teachers training, operating personnel, improving Computer Aided Instruction (CAI) parallel to technological advancements, and performing tasks related to information processing formed among the main responsibilities of government (Ozar & Askar, 1997).

As to other countries, from Western European countries, in Germany also there have been strong debates about the impact of the computers in TCs. In 1988 the broad concept of ICT started being discussed between ministries of education, and colleges (Ajayi, 2002). After four years of discussion it was agreed that ICT should be introduced in TCs and the importance of the new technologies for the future growth of the country was stressed and a computer literacy education for all teachers training was demanded (Ozar & Askar, 1997). In Germany, education in the teaching of ICT is one of the core curriculum options in teachers training. Consequently, the institutions of teacher education concerned are obliged to offer the subject as the compulsory, but it is left to the trainees to decide whether or not to include it in their overall course of education in TCs (Fishers, 1999). Despite the number of challenges that the African countries are facing, the application of ICT has been introduced in TCs and other education institutions. The symposium organized by the Economic Commission for Africa (ECA), the International Telecommunication Union (ITU), UNESCO, the International Development Research Centre (IDRC), and Bella Net International, urged the Conference of Ministers in Africa to consider the importance for Africa of the global information revolution (Ajayi, 2002; ADF, 1999). Consequently, the African Information System Association (AISA) action plan framework called for the formation of National Information and Communication Infrastructure (NICI) plans and strategies in TCs and others education institutions (UNESCO, 2003).

Following the number of conferences held in Africa, most of the countries introduced ICT in the educational system. In Nigeria through the 2001 Federal Government National Policy for Information Technology (IT), and this was followed up with the establishment of the National Information Technology Development Agency (NITDA), which was charged with the implementation of the policy, introduced ICT in educational system and particularly in Teachers Colleges (Ajayi, 2002). This has impacted on the quality and quantity of teaching and learning process in Teachers Colleges (Hafkin, 2002). In concrete terms, ICT enhanced teaching and learning through its dynamic, interactive, and engaging content; and it can provide real opportunities for individualized instruction in Teachers Colleges (Yusuf and Onasanya, 2004). In Rwanda, the Rwandan government views ICT as a key tool for transforming the economy, with the education sector playing an important role in developing the necessary human resources (Jensen, 2002). Since 2000 there has been a big push to introduce computers into TCs and integrate ICT into the education curriculum through a range of initiatives (Hall, 1998). However, it is realized that the potential of ICT will not be realized by the mere introduction of computers and ICT infrastructure in TCs (Ertemer et al, 2001). Thus Rwandan government implements ICT in TCs and other education institutions through engagement of pre-service and in-service training of teachers that can be reconceptualised as access to the capability of what Jenkins calls participatory culture (Dellit, 2001). It is also argued that without a shift in practices of teaching and learning with ICT in TCs and other education institutions, young people are not likely to learn how to exploit the capabilities offered by access to ICT (UNESCO, 2003).

In Kenya TCs, computers were introduced in the 1970s and the Internet became available in 1993 (UNESCO, 2008). The study by Ford (2007) on technologizing Africa found that computer use in Kenyan TCs is still in its early phases, and concluded that the perceptions and experiences of teachers and administrators in TCs do play an important role in the use of computers in Kenyan TCs. Kenyan government providing pre-service and in-service training programs to enable them to successfully teach using computers in the classrooms has been made pertinent (Momanyi, Norby & Strand, 2006). The government and the Ministry of Education, Science and Technology (MoEST) needed to review both teacher preparation and staff development programs, as well as develop a revised national plan to implement ICT into the curriculum (Wanjiku, 2008).

In Tanzania through Education Sector Development Programme (ESDP), the government has identified ICT as an education and training policy issue and has made the promotion of science and technology as a goal (Tilya, 2007; Nkumbi & Komba, 2006). However, despite the integration of ICT in all educational objectives in Tanzania, for almost a decade, ICT has not fully been a priority in Education Sector Development Program (ESDP) activities (Sakamoto et al, 1995). Moreover, Tilya (2007) acknowledges that ICT can play an important role to achieve all ESDP objectives in both pre-service and in service training of teachers, not much ICT as a tool for teaching and learning is used. As like in other sub Saharan countries, the use of ICT to enhance teaching and learning activities in TCs in Tanzania is supported by ICT Policy for Basic Education and the National ICT Policy of 2003 (URT, 2007, 2003). The ICT policy for Basic Education and National ICT Policy of 2003 is not only aimed at accommodating training in ICT but also ICT-enabled teaching and learning in TCs. ICT is taught as a subject in TCs and integrated as a pedagogical tool for teaching and learning in other subject areas (URT, 2007). The objective of Teachers Colleges (TCs) in Tanzania is to prepare teachers for primary and secondary schools (URT, 1995). Graduates from the TCs are awarded certificates and diplomas in education.

According to the education system of Tanzania, TCs are educational institutions that are at the third level of education, that is, tertiary level of education. TCs in Tanzania are classified into Diploma TCs offering diploma in secondary education and Grade A TCs offering Certificate in primary education. On the other hand, the application of ICT in teaching and learning in Tanzania's (TCs) has been introduced (URT, 2007). A study by Hare (2007) showed that the Ministry of Education with support from the Swedish International Development Cooperation Agency (SIDA) initiated a program for introducing ICT in TCs in 2005. The program aimed at improving the quality of TCs by using ICT to both pre-service and in-service teachers (URT, 2007). Through this collaboration of Ministry of Education and Vocation Training (MoEVT) and the Swedish International Development Agency (SIDA) all 34 public TCs were

equipped with thin client solutions and VSAT connectivity, tutors were trained in computer literacy and tutor technicians received training in technical maintenance support and networking essentials.

3.0 Statement of the Problem

It is evident that the application of ICT in TCs helps both in making teaching and learning process to be effective. It has been established that ICT has the capacity to empower tutors and learners beyond traditional teaching and learning because ICT provides flexible teaching and learning (Khirwadkar, 2007). The strength of ICT in teaching and learning in education institution can be seen in its qualities such as interactivity, intelligent guidance and dynamic feedback, multiplicity of symbols and system interactivity (Dellit, 2001). The application of ICT enables tutors to support student teachers during the learning process where also both student teachers and tutors can have electronic discussions without meeting in face to face.

It can also provide a potential means for addressing both access and quality in delivering of information (Evoh, 2009). Despite the efforts done by the government and other stakeholders in continuing to make effective use of ICT in education like to train tutors in the TCs on the use of ICT in teaching and learning accompanied with provision of ICT facilities, there is still minimal application of ICT in teaching and instruction activities (Hare, 2007). Most TCs are already have ICT facilities and using ICT but mostly the TCs application of ICT is limited to basic applications such as administration, teaching of computer literacy and internet skills (Issa, 2007). In most cases, ICT has been reported not used as a medium of instructions to enhance curriculum delivery (Hare, 2007).

A study by Issa (2008) on ICT use in teaching and learning in public teachers colleges in Tanzania found out that even if tutors have attended several sessions of training in ICT still they are not effectively integrating ICT in teaching and learning meanwhile the study by Mswanyama (2004) on the role of ICT on learning and training in teachers colleges found that ineffective training in ICT for tutors hinders effective use of ICT in teaching and learning. In these two studies conducted in Tanzania context none of them focused on the applicability of ICT in enriching curriculum implementations in TCs in Tanzania. Therefore, this paper seeks to study on ICT application in teaching and learning processes by tutors: a case of two selected Tanzania teachers colleges

4.0 Methodology

The descriptive research design using case study was adopted and ultimately used in this study. The sample sizes of 46 respondents from the two colleges' selected using simple random approach were consulted during carrying the study. This sample size was drawn from first the complete list of all ordinary teaching staff from the two Teachers College and second those with specific positions who had required information and these included principals, academic deans, heads of ICT department. A simplified formula for proportions by Yamne (1967) was adopted to obtain the desired sample size for tutors, assuming 95% confidence level and precision of 0.05: $n = N / (1 + N(e)^2)$ where n is the sample size for tutors and e is the level of precision: $n = 67 / (1 + 67 * (0.05^2))$, Sample size for tutors (n) = 40. The sample size for tutors (n) = 40 was divided by 2 to get equal chance of the respondents from Bunda and Tarime TC. Therefore, the sample size selected included 2 principal, 2 academic dean, 2 head of ICT department and 40 tutors which make the total of 46 respondents as represented in table 1. **Source: Researchers' data (2013).**

Table 1: selected sample size used in carrying the study

Category of respondents	Target Population	Sample Size Selected			
		Bunda TC	Tarime TC	Total	Percentage (%) of the Total Size
Principals	2	1	1	2	4.35%
Academic Deans	2	1	1	2	4.35%
Heads of ICT Departments	2	1	1	2	4.35%
Tutors	67	20	20	40	86.95%
Total	73	23	23	46	100%

Data regarding the application of ICT in teaching and learning process were mainly collected using questionnaires being also supplemented with other methods of data collection such as interview, observation and documentary review. The collected data were analyzed using descriptive analysis such as mean standard deviation and frequencies to ascertain the meaningful information regarding the extent of ICT application in teaching and learning process in Teachers Colleges.

5.0 Results and Discussion

5.1 Extent of Application of ICT in Teaching and Learning Process

This paper seeks to identify the extent of ICT application in enriching curriculum development for the sake of improving teaching and learning processes in TCs. Forty six (46) were consulted during carrying out the study at Bunda and Tarime TC. To accomplish this, structured questionnaires were administered to tutors, principals, academic deans and heads of ICT departments so that they can indicate the extent of application of ICT in teaching and learning process. Additionally semi-structured interview were conducted to principal, academic deans and heads of ICT departments on the extent of application of ICT in teaching and learning process in TCs. The results regarding ICT application are as depicted in table 2. **Source: Researcher's data (2013)**

Table 2: Extent of Application of ICT in Teaching and Learning Process at TCs.

Application of ICT	Responses			Total	Std. Deviation	Mean
	1	2	3			
To create teaching aid like visual graphics, charts and drawings.	21	16	9	46	.773	1.74
To carry out power point presentation	15	21	10	46	.737	1.89
To use scanner or digital camera to import graphics, photos and text for presentation	9	20	17	46	.739	2.17
To use computer to prepare schemes of work and lesson plans.	13	19	14	46	.774	2.02
To use search engines to find educational resources that support teaching and learning in my subject.	28	15	3	46	.622	1.46
To use the word processor (writer), database (base), presentation (Impress) and spreadsheets (calc) into my subject area curriculum	12	21	13	46	.745	2.02
To use ICT to download resources useful for teaching in my Subject	31	14	1	46	.526	1.35
Grand Total Mean						1.807
Responses key :						
1: Large Extent (51% - 100% of lessons taught in an academic year) which means in every preparation of lesson notes/plans/scheme of work, in daily presentation of the lessons, in assessing students, in suffering materials.						
2: Small Extent (10 – 50% of lesson taught in an academic year) which means in every preparation of lesson notes/plans/scheme of work, in daily presentation of the lessons, in assessing students, in suffering materials.						
3: None (0% - 9% of lesson taught in an academic year) which means in every preparation of lesson notes/plans/scheme of work, in daily presentation of the lessons, in assessing students, in suffering materials.						

The mean respondents' response rate of 2 was the threshold point in deciding the extent of ICT application in teaching and learning processes. The mean response rate greater than 2 implied not/less extent of ICT application while the mean response rate of below 2 reveals large extent of ICT application in teaching and learning processes. The extent of ICT application was measured based on variables such as: preparation of lesson notes/plans/scheme of work, daily presentation of the lessons, assessing students, in download materials and caring out power point presentation. The research findings depict that, generally there is large extent of ICT application by the tutors in teaching and learning process (Grand mean score from respondents = 1.807). In other word there is large extent of ICT application by tutor in teaching and learning process in TCs specifically when preparing lesson notes/plans/scheme of work, presentation of the lessons, assessing students and in download materials but not in all educational activities.

Specifically the study findings reveal that the extent of ICT application by the tutors was found to be large when they used ICT facilities to download resources which are useful in teaching subjects (Mean response score = 1.34) and to use ICT facilities as a search engine to find educational resources that support teaching and learning activities (Mean response score = 1.46). Furthermore, the respondents pointed out that the large extent application of ICT in the teaching and learning process is in creating teaching aids like visual graphics, charts and drawing (Mean score from respondents = 1.74), followed by using ICT in carrying out power point presentation (Mean response = 1.89). However the research study show small extent of application of ICT in the teaching and learning process in using scanner or digital camera to import graphics, photos and text for presentation (Mean of respondents = 2.17), in using computer to prepare schemes of work and lesson plans (Mean of respondents = 2.02) as well as using word processor (writer), database (base) presentation (impress) and spreadsheets (calc).

The extent of ICT application was also assessed based on the demographic characteristics of respondents such as gender, level of education as well working experiences. The findings confirm that there is large extent of application of ICT in teaching and learning process is based on the gender (69.6%) of male applied more ICT in teaching and learning process than (30.4%) female. On the aspect of education, the findings reveal that the respondents who hold bachelor degree in education (52.2%) and master's in education (15.2%) applied ICT in teaching and learning process.

Further research findings Through observation approach portrays that those who had working experiences of 1-2, 3-4 and 5-6 years applied ICT skills to make power point presentation and downloading material which is useful in teaching and learning process to a large extent because they possessed enough knowledge on how to use ICT facilities and ICT was taught during their studies in bachelor degree in education and master's degree in education. Contrary the findings show that those who had 7 and above years of teaching experience applied ICT in small extent or non because they lack knowledge on how to use word processor (writer), database (base) presentation (impress) and spreadsheets (calc) into the subject areas, to use computer to prepare schemes of work and lesson plans, use of scanner or digital camera to import graphics, photos and text for presentation, carrying out power point presentation. As evidenced through interview guide; Principals, Academic deans and heads of ICT departments in the two TCs were found to aware of the application of ICT in teaching and learning process.

The respondents further reported that the available ICT facilities were mainly used in teaching and learning process during their lessons, especially before the class and during the class hours. It can be ascertained that tutors from both Bunda TC and Tarime TC apply ICT in teaching and learning process as commented by Teachers Agents (1998) that the use of ICT not only facilitated understanding and provided clear presentation but it made instruction more interesting. It

was further noted that some tutors using ICT facilities such as the power point presentation, search engine to surf materials for their lessons and preparing their schemes of work, lesson plans and lesson notes.

These findings are also supported by the study of Lei and Zhao (2009) entitled *Technology Uses and Student Achievement in Teachers Training: A longitudinal study of computers and education*. London which revealed that in the process of applicability of ICT in enriching curriculum implementation in teachers training it was used different in teaching and learning process. It was further observed that ICT is used to facilitate professional development and networking, ICT were used to connects tutors and teachers to a larger international teaching community, ICT used to promote learning activities, developing new methods of facilitating learning and evaluating student performance in TCs, ICT is used as the tool of knowledge sharing and training in TCs and ICT is used as the one of the communication tool in TCs. Generally the findings shows that at least each respondent pointed one or more than one application of ICT in teaching and learning process in TCs though the main areas of ICT application in teaching and learning process in TCs were: creating the teaching aid like visual graphics, charts and drawings, carrying out power point presentation, used as a search engines to find educational resources that support teaching, downloading resources which is useful for teaching in subject area, the use of scanner or digital camera to import graphics, photos and text for presentation, the use of computer to prepare scheme of work and lesson plan and the use of word processor (writer), database (base), presentation (Impress) and spreadsheets (calc) into subject area curriculum.

The application of ICT in the teaching and learning process was found to be of paramount important as it increases the interaction in the classrooms, contribute to the sharing of different ideas between tutors and student teachers, simplifies the teaching and learning process and encourage and support independent learning to students. This can be evidenced when one of the Principal from Bunda TC said that: "ICT enables to interact with my student and facilitates independent learning". These findings are in line with that of Dellit (2001) which show that application of ICT makes institutions more efficient and productive and enhances and facilitate pedagogical activities. Similarly, Evoh (2009) posited that the fact that ICT is accurate, fact and reliable and has the capacity to store and disseminate large information within the shortest periods, makes it a veritable and indispensable instrument for distance education programme

6.0 Conclusion and Recommendations

The application of f ICTs in teaching and learning processes by Teachers Colleges in has found to have positive impact on teaching, learning. The study found large extent of ICTs application by tutors although its application is not efficient despite the roles ICTs can play in education. The major reason being poor policy and project implementation strategies and limited or poor information infrastructure towards ICT application in teaching and learning process. In order to ensure that ICTs are widely applied in teaching and learning process in Teachers Colleges, the study comment the government to ensure that ICT policy statements are translated into reality. An ICT policy implementation commission should be created. This commission should be funded and given the power to provide ICT facilities in the colleges and monitor their use. ICT education should be made compulsory for all Colleges students .Efforts should be made by Ministry of Education to post teachers skilled in ICTs to each college to impart ICT skills to the students.

7.0 References

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