Factors for Teachers' Low Use of ICT in Secondary Schools in Tanzania

Shima Dawson Banele

The Open University of Tanzania, Faculty of Education, P.O. Box 23409, Dar es Salaam, Tanzania

Abstract: - **ICT in education shifted classroom activities from traditional to technological mediated teaching and learning paradox. There are need to understand factors abided to teachers only on low use of ICT in secondary schools classroom teaching and learning activities. Purpose of the study dwelled to influence stakeholders on current ICT devices available in schools and teachers' influencing factors replicated to low use of technologies so that to step in Tanzania secondary schools. Descriptive cross sectional survey research design bedded into ethnographic methods allowed narrative nature of teachers' norms and attitudes to emerge. 50 teachers, 12 heads of schools and 12 secondary schools from Kibaha district were selected using simple stratified and purposive procedures. Data was collected using structured checklist observations and Focus Group Discussion techniques. Reliability of the data collection instruments was determined by split-half method. Collected data was analyzed using descriptive statistics; however the study findings had implication on use of ICT in secondary classroom.**

Key Words: **ICT, teaching and learning, cognitive, perception, classroom.**

I. INTRODUCTION

Several educational issues in Tanzania justified the need for this paper; ICTs for education had been perceived as potentially deterrent to smooth teaching and learning; Tanzania through National ICT Policy (URT, 2003) proclaimed on the role of ICT and new opportunities it offered to improve education delivering and quality (URT, 2003). Despite of being crucial in teaching and learning, its uses are largely neglected by secondary school teachers resulted the Tanzania government through Ministry of Education and Vocational Training (MoEVT) continued implementing various projects to enable acceptance and use of ICT in government teachers' colleges, secondary and primary schools and its agencies (URT, 2007) to marginalized teachers potential characters in cognitive development, thereafter support performing differentiated instruction creating opportunities for collaboration, engage multiple intelligences for teaching and learning (Stoilescu, 2005) and shaping thought (Säljö, 1999).

Information and Communication Technologies (ICTs) have been considered as important tools in teaching and learning, solving social and economic problems, making sense of the world. ICTs in Tanzania context for example had been used in politics as an important tool for speeding up democracy (e.g. Bunge in Tanzania); platforms for debate in local languages (e.g. Jamii Forums in Tanzania); increased the coherence of information and has made it easier for ordinary citizens to understand patterns of governmental actions and policies. The importance of ICTs as an important tool is also evident in the Sustainable Development Goals (SDGs); for instance goal nine of the SDGs of 2030 agenda substantiates the importance of ICTs in bridging the digital device to facilitate innovative sustainable development. According to Kelles-Viitanen, (2003), ICT plays a major role in all aspects of national life and has fundamentally changed old ways of doing things basically embedded on traditional practices and procedures (Banerjee et al. 2004; Jorgenson and Stiroh, 2000).

The power and advantages of ICTs separates it from traditional ways of teaching and learning. For example, limited access to resources can be minimized while use of ICT in teaching and learning is likely to motivate both teachers and learners. ICTs helps to clarify difficult concepts, save time, make learners active, and simplify teachers' work (Cavas et al. 2009; Steel 2009; Mwalongo, 2010). Although using ICTs in classroom leads contradictions influenced changes to all school elements system dramatically Kelly and Tangney, (2006) opined on power of technology to remove teacher from being primary controller of information and to empower students accessing information from variety of sources. ICTs stretched teaching where teachers stopped, for example flipped classroom practices where students continue learning in group space by using variety of Learning Management System (LMS) such as MOODLE, WEBCT, White Interactive Board (WIB) and in social networks such as whatsApp, twitters, blogs and facebook (Shan, 2013). Therefore technology had ability to transform the whole learning culture from traditional–teacher-centred to free, dynamic and interactive culture (Hammond, et.al. 2008).

Tanzania secondary education had the circle of 6 years after completion of primary education level: 4 years of ordinary level and 2 years of advanced level. According to Education Tanzania Policy (ETP, 2014) ordinary secondary education was advocated as part of basic education (MoEVT, 2014) being free and compulsory for every enrolled student in government owned and with costs sharing (school fees) to those enrolled in private owned schools. Secondary education is counted as bridge to pre-university (Advanced level) and tertiary education level; in addition secondary education certificate is considered as significant pre-requisite criterion to get employed in public sectors therefore these factors

necessitate students graduated at this level to be smart and well trained to live in so called "knowledge society" sided to Grabe, (2007) who declared that in dynamic knowledge society there are changes in people's thinking, working and ways they live. Basing to Ghavifekr, Afshari and Amla Salleh, (2012) teachers had to consider importance of using ICTs into curriculum.

Different documents of the United Republic of Tanzania emphasized on the use of ICT in education and all other sectors for building knowledge economy including: Poverty Reduction Strategy Paper (2000), the Tanzania Vision 2025, the Education Sector Development Programme (1998), the Teacher Education Master Plan (2000), Secondary Education Master Plan (2000), ICT Policy for Basic Education (2007), the Higher Education Sub-Master Plan (2003-2018), and the National ICT Policy (2003), Big Results Now (2014), Education Policy (2014), Science, Technology and Innovations (STI) and National Research and Development Policy, (URT, 2010; Komba, 2009; ICT4E, 2007) visualized the community to change mindsets from "commodity" to "knowledge and industrial middle earning income" economy as stated in vision 2025.

The witnessed efforts done by Tanzania government to mainstream ICTs in educational settings include: steadily undertook review of teachers' training curricular to incorporate ICT as a compulsory subject in pre-service training (see, Swarts and Washira, 2010; Lujala, 2010). Low secondary school teachers' ability to utilize multi-media identified as major reason for slow up-take of ICT in education (URT, 2016); doors for continuous collaboration with stakeholders to fill and tackle technological gaps were opened for example through support from SIDA, the government received and disbursed ICTs gadgets and equipments to 32 teachers' colleges (MoEVT, 2007) with assumptions that every teacher trainee could be competent to use ICTs for teaching and learning and in other professional responsibilities.

Besides, Information and Computer Studies (ICS) syllabus and the subject were introduced in primary and secondary schools curriculum (Hare, 2007; Mwalongo 2010, TIE, 2010). However, in ordinary secondary schools ICS subject is still an optional and few students are examined; from 2016 new courses for students completed ordinary secondary schools and passed ICS subject are selected directly to join Dar es Salaam Institute of Technology (DIT) to be prepared as personnel suits requirements for industrialized and knowledge based economy. Moreover, there are continued fixation of telephone networks and reduction of bandwidth costs and internet (Hesselmark 2003; Swarts and Wachira 2010); and rural located secondary schools had been installed with grid electricity distributed through Rural Electricity Authority (REA) program.

Additionally, other initiatives are observed in provision of skills and knowledge for ICT use in classroom: ICT-Based In-

Service Teacher Education for Secondary schools (ICT-BITES) and short courses training; television broadcasts ICT literacy sessions aired in *Kiswahili* and English by *TBC* and *Star TVs* to enable wide coverage tailored to encompasses teachers' knowledge and skills in using ICTs in classroom activities. Further, mobile telephone companies including *Halotel*, Vodacom, Airtel, Zantel, TTCL and Tigo subscribed internet services to be used in schools and with individual dwellers. Room for joint-venture supports in designing, development and distribution of e-content learning materials is also and evidence for example the University of Dar es Salaam collaboratively with Halotel designed useful application known as *halo-app* comprised the store for all secondary subjects' content material; CAMFED distributed iPods installed with games and books to assists form one students to encounter English language incompetence.

Significantly, the Ministry of Education, Science and Technology (MoEST) under joint support from World Bank and Global E-Schools and Communities Initiative (GESCI) formulated and is in implementation of the ICT Competency Framework for Teachers in Tanzania (ICT-CFT). This Competency Framework is based on multiple global standards covering 15 areas, 5 educational domains and 3 progressive levels namely technology literacy, knowledge deepening and knowledge creation for teachers. The framework aimed at promoting teachers development model for effective ICT integration to improve teaching across 6 education system domains: "Policy and vision, Curriculum and Assessment, Pedagogy, ICT, Organization and Administration and Teacher Professional Development" (UNESCO, 2008; Swarts and Washira, 2010; Hooker *et.al* 2011). MoEST partnered with African Digital Schools Initiatives (ADSI) undertaking the project for digitalize and changing classroom didactics; offered ICT training to teachers; disbursed working tools including laptops and overhead projectors to secondary schools from Pwani and Morogoro regions, Kibaha District inclusively.

1.1 Statement of The Problem

Secondary schools education level in Tanzania is faced with multi-challenges including shortage of textbooks, static learning environment depending on teachers as sole source of learning content, abstract learning environment, rote students learning all of which needs use of technology to solve it due to its advantages. There are stipulated evidences on efforts done by the Tanzania government to support use of ICTs in secondary schools classroom; still there are low uses of little available technology for classroom teaching and learning activities. Tanzania is striving to become middle earning economy through industrialization therefore ICT implementation should base on students learning opportunities (Sodhi, 2013); Hamidi et al. (2011) considered ICTs as vital for developing countries sustainability to meet 21st century technological, knowledge and skills required. Teachers denied using technology in classroom due to attitude and perceptions as Blanknskat et. al (2006) also Shaft, Sharfman and Wu,

(2004) cemented that teachers' altitudes and norms are major factor in predicting behaviors related with use of ICTs in teaching and learning. This research dwelled to look into values teachers hold in relation to factors affecting the subsequent use of ICTs for teaching and learning activities in secondary schools.

1.2 Purpose of The Study

The main purpose of the study was to identify available ICT devices and explore teachers' factors portrayed to use of ICT in secondary schools teaching and learning at Kibaha District, Tanzania.

II. METHODS AND MATERIALS

The study was conducted at Kibaha District, Pwani region, Tanzania. The descriptive cross sectional survey design based on ethnographic methods allowed narrative nature of norms and altitudes to emerge without altering natural context. The target population was 31 secondary schools, 31 heads of schools with 123 classroom teachers. 12 schools make 38% and 12 heads of schools were purposively selected and 50 make 41% classroom teachers was selected using stratified randomly technique as schools had computers and teachers were exposed into ICT training and projects to encompasses skills and knowledge. Qualitative data was collected using checklist and Focus Group Discussion. The reliability for research instrument was determined by Spearman Brown coefficient of 0.746. However data was analyzed and presented using descriptive statistics such as frequencies, tables, charts and narrative themes.

III. RESULTS AND DISCUSSIONS

3.1 Availability of Infrastructures to Support Classroom Teaching and Learning

The researcher involved head of schools from 12 secondary schools to fill checklist on availability of computer laboratories, source of power and associating costs, internet connectivity and number of devices to teachers. 75% of schools possessed computer laboratories and remained 25% do not.

Pie Chart 3.1: Computer Laboratory Status (n=12)
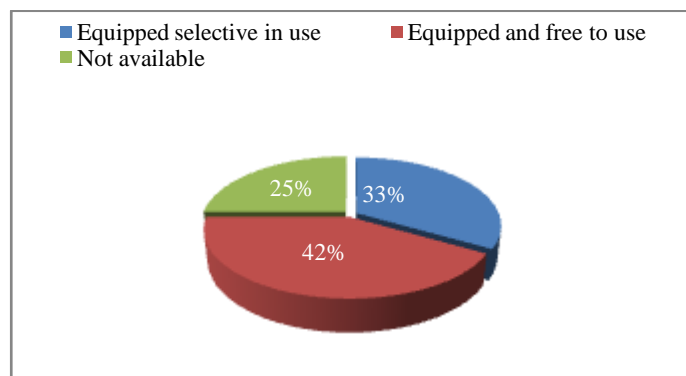
Source: Field data; 2019

Findings also proved there are different levels of computer laboratories accessibility: 33% equipped selected in use, 42% equipped and free to use and 25% not available as shown in pie chart 3.1.

Restrictions, bureaucratic procedures, rules and regulations, lack of technical support in computer laboratories are among factors fostering teachers' low use of ICT in classrooms. Electricity is a pre-request requirement fostering ICTs use in classroom; findings on source of electric power revealed 92% of schools depended on national grid electricity compared to 8% relied on generators. These are positive outcome of the government efforts through Rural Electric Authority (REA) program to accomplish the mission of ensuring electricity is supplied in every village at cheap installation costs and schools being among beneficiaries; abrupt electricity cut-off during lesson delivery frustrates teachers opt to continue with traditional practices. There were defaults in classroom electricity supply infrastructures as switches and sockets were not well furnished therefore teachers and students had to shift to furnished classrooms wasted allocated subject lesson time. Also there are disparities of electricity costs owed to schools basing to schools size which are determined by number of students and buildings; and nature of school implies either day or boarding.

Schools were highly connected to internet using router (60%), modems (33%) and switch (7%) with internet costs described: 5 owed Tshs. 0-50,000 (41.7%), 3 utilized Tshs.51000-100,000 (25%), 1 owed Tshs.101, 000-150,000 (8.3%) and finally 2 utilized greater than Tshs. 201,000 (25%); categorized into zero, moderate and high internet cost. There are stakeholders subscribing free internet in schools example *Vodacom, Tigo, Halotel* and TCRA. Teachers are also face difficulties in accessing internet because head of schools denied accommodating associating costs into procurement plans and budget.

There are large disproportional between number of teachers to desktops, laptops and overhead projectors thus discourage use ICTs in classroom against traditional mode. The availability of overhead projectors in secondary schools shows: 2 schools makes 17% with 21-60 teachers does not possesses any, 7 schools makes 58% had 1-3 overhead projectors to be utilized by 21-60 teachers and 3 schools makes 25% to be utilized by 21-40 teachers.

Table 3.1: Availability of Laptops and Overhead Projectors (n=12)

Number of Teachers	Number of Overhead Projectors			TOTAL
	None	1-3	4-6	
Between 21-40	1	4	3	8
Between 41-60	1	3	0	4
TOTAL	2	7	3	12
Number of Teachers	Number of Laptop			TOTAL
	1-5	6-10	11-15	
Between 21-40	5	3	0	8
Between 41-60	2	0	2	4
TOTAL	7	3	2	12

Source: Field data; 2019

Shortages are revealed in availability of laptop used by 21-60 teachers for lesson delivering: 7 schools had 1-5 laptops, 3 schools possessed 6-10 and 2 schools had 11-15 laptops as presented in table 3.1.

The desktop computer-teacher ratio is counted 1:2, 1:3 and 1:4+ basing to the findings presented in table 3.2. This necessitate schools to set predefined schedule for teachers to follow for utilizing devices or teachers had to scramble to get accessibility or denied to use and gain technology advantages.

Table 3.2: Availability of Desktop Computers

| Number of teachers	Number of Desktop			Total
	1-10	11-20	21-30	
Between 21-40	4	2	2	8
Between 41-60	1	3	0	4
	5	5	2	12

Source: Field data; 2019

There are schools with desktop computers dumped at the backside of laboratory due to technical defaults implicative into lack of technicians to undertake routine maintenance.

3.2 Factors Influencing Teachers' to Use ICTs in Secondary Schools Classrooms

Interview schedule with items to solicit information from classroom secondary schools teachers was organized into areas impacting teachers' altitude and norms towards practices including training, teachers' technology adoption efforts, competencies and confidences. Findings revealed Teachers were exposed to four modes of trainings including in-service programs (34%), pre-service programs (46%), online (2%) and other mode (16%) and not exposed to training (2%) as shown in bar chart 3.1.

Bar Chart 3.1: Modes of ICT trainings
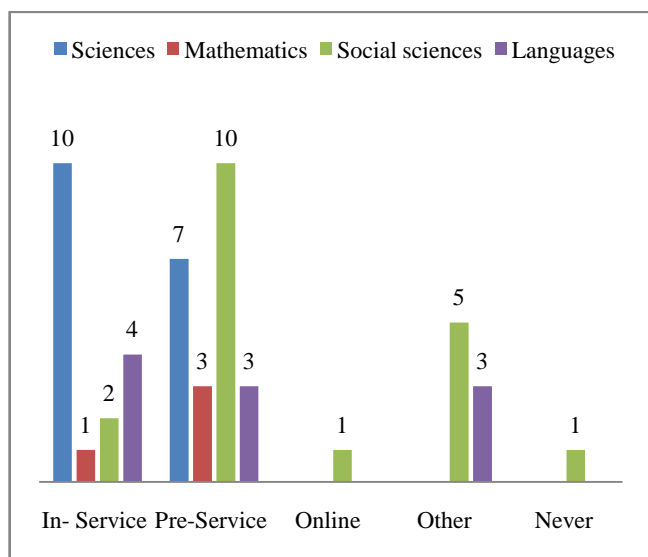
Source: Field data; 2019

Teachers should strive to expose themselves in various modes of ICTs training such as online, open and distance learning courses offered by the Open University of Tanzania either for free or less costs sharing despite of waiting for those planned by the government only.

Teachers were trained to use ICTs in classroom activities though they don't posses intrinsic motives to use it routinely as mostly claimed on need of motivation, follow-up, technical support, material and moral support, insufficient devices and unsupportive infrastructures. Also teachers claimed for unsustainable discriminatory nature of in-service ICT trainings whereby science and mathematics teachers are highly favored.

Findings proved that teachers had conflicting mindset to either continue with traditional pedagogies which are familiar and comfortable with or accept use of new ICT-mediated for classroom teaching and learning. Heads of schools are core administrators and managers obliged to make teachers switching to new modalities for improving teaching and learning practices through ICTs; therefore should continue to inspire, support and encourage teachers until they see the value and accept technology use for classroom practices.

It was revealed that teachers' continuing practices in using ICT several times enable gaining of competence and confidence than counterparts who are reluctant are continued to be anxiety, incompetence, less comfortable to fit technology into pedagogy.

IV. CONCLUSIONS

4.1 Availability of Infrastructures to Support Classroom Teaching and Learning

The study recognized schools possessed computer laboratories but restrictive to use, had good status of electricity provision though classrooms had defaults in switches and sockets; also electricity and internet consumption costs varies among schools. Schools had very few desktop computers, overhead projectors and laptops.

4.2 Factors Influencing Teachers' to Use ICTs in Secondary Schools Classrooms

There is discriminatory unsustainable training offered in priority of teachers subjects of specialization. Teacher lacks institutional supports replicated to low technology acceptance and practices to raise competence and confidence.

V. RECOMMENDATIONS

Basing to study findings the following recommendations are presented:

a) Teachers should create readiness and positive altitude to use technology; also integrate Bring Your Own Devices (BYOD) strategy to cut down devices shortage.

b) Head of schools are obliged to offer support, motivate and supervise teachers to use ICTs in classroom teaching and learning activities.

c) Ministry of Education, Science, Technology and Vocational Training (MoEST) collaboratively with Presidents' Office Regional Administration and Local Government (PO-RALG) should design and implement ICT in-service training for all secondary school teachers in the country; budget for ICT devices procurement and disbursement; employ or hire technicians to eradicate shortfalls in ICTs devices available in schools and facilitate refurbish classroom infrastructures to accommodate new technology mediated practices.

REFERENCES

[1]. Afshari, M., Bakar, K. A., Su Luan, W., Samah, B. A., & Fooi, F.S. (2009). **Factors Affecting Teachers' Use of Information and Communication Technology. International Journal of Instruction. 2(1), 77-104.**

[2]. Balanskat, A., Blamire, R. & Kefala, S. (2006). **The ICT Impact Report, A Review of Studies of ICT Impact on Schools in Europe**. European School Net in the Framework of the European Commission's ICT cluster. Available online at: http://www.aefeurope.be/documents/RAPP_doc254_en.pdf accessed 18 January 2019.

[3]. Banerjee, A., Cole, S., Duflo, E. and Linden, L. (2004), **Remedying Education: Evidence**

[4]. Cavas, B., et al. (2009), A study on Science Teachers Attitudes Toward Information and Communication Technologies in Education, **The Turkish Online Journal of Educational Technology vol. 8, no. 2, pp. 20-32**

[5]. de Corte, E., Verschaffel, L., Entwistle, N., & van Merrienboer, J. (Eds.). (2003). **Powerful Learning Environments: Unraveling Basic Components and Dimensions.** *Oxford: Pergamon/Elsevier.*

[6]. Ghavifekr, S., Afshari, M., & Amla Salleh. (2012). Management strategies for E-Learning system as the core component of systemic change: A Qualitative Analysis. *Life Science Journal, 9(3), 2190-2196.*

[7]. Grabe, M., & Grabe, C. (2007). **Integrating Technology for Meaningful Learning (5ᵗʰ Ed.).** Boston, MA: Houghton Mifflin.

[8]. Hammond, M., Crosson, S., Fragkouli, E., Ingram, J., Johnston-Wilder, P., Johnston-Wilder, S., Kingston, Y., Pope, M., & Wray, D. (2008). **Why do some student teachers make very good use of ICT? An exploratory case study**. Coventry: University of Warwick.

[9]. Hare, H. (2007). **ICT in education in Tanzania,** in G. Farrell, S. Isaacs & M. Trucano (ed.), *Survey of ICT and Education in Africa: 53 Country Reports*, DC: infoDev / World Bank, Washington.

[10]. Hooker, M., Mwiyeria, E., & Verma, A. (2011**). *ICT competency framework for teachers (ICT-CFT): Contextualization and piloting in Nigeria and Tanzania* (World Bank and GESCI Initiative Synthesis Report No. Draft). Dar-es-Salaam, Tanzania: (MoEVT), Retrieved on 12 January 2019.from: http://www.gesci.org/assets/files/Tanzania_Needs_Assessment_Report_Draft_Final_230911%20_3_.

[11]. Lawless, K., & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns and ways to pursue better questions and answers. **Review of Educational Research, vol. 77, no. 4, pp. 575-614.**

[12]. Mwalongo, A. (2010). Teachers' Knowledge, Beliefs and Pedagogical Practices in Integrating ICTs in Different Curriculum Areas in Secondary Schools: A Case Study of Pakistan, *Educational Research Journal*, **vol. 13, no. 1, pp. 69-79.**

[13]. Keengwe, J., & Onchwari, G. (2008). Computer technology integration and student learning: Barriers and promise, **Journal of Science Education and Technology, vol. 17, pp. 560– 565.**

[14]. Komba, W. (2009). Increasing Educational Access through Open and Distance Learning in Tanzania. A Critical Review of Approaches and Practices. **International Journal of Education and Development Using Information and Communication Technolgy, 5(5), 8–21.**

[15]. Mwalongo,A. (2011). Teachers' Perceptions about ICT for Teaching, Professional Development, Administration and Personal Use. *International Journal of Education and Development using Information and Communication Technology (IJEDICT),* **2011, Vol. 7, Issue 3, pp. 36-49.**

[16]. Steel, C. (2009). Reconciling university teacher beliefs to create learning designs for LMS Environments, **Australasian Journal of Educational Technology, vol. 25, no. 3, pp. 399-420.**

[17]. Swarts, P. & Wachira, E. M. (2010). **Tanzania: ICT in education situational** analysis (Survey Results Report) (p. 67). Global e-Schools and Communities Initiative (GESCI). Retrieved on 10 December 2018 from http://www.gesci.org/assets/files/Knowledge%20Centre/situationa l%20Analysis_Tanzania.pdf

[18]. Tanzania Institute of Education. (2009). **Information and Computer Studies Pedagogy Syllabus for Diploma in Secondary Education.** Dar es Salaam, Tanzania: Tanzania Institute of Education.

[19]. United Republic of Tanzania. (2003). **National Information and Communication Technologies Policy.** Dar es Salaam: Ministry of Communication and Transport.

[20]. United Republic of Tanzania. (2004). **Information and Communication Technology: Education Management Information System** (EMIS) Development Plan 2004-2007. Dar es Salaam: Ministry of Education and Culture.

[21]. United Republic of Tanzania. (2007). **Information & Communication Technology (ICT) Policy for Basic education** (Policy Document) (pp. 1–30). Dar es Salaam, Tanzania: Ministry of Education and Vocational Training (MoEVT). Retrieved from http://www.moe.go.tz/index.php? December 30, 2018

[22]. United Republic of Tanzania. (2010, June). **Education Sector Development Programme-ESDP (2010-2015).** Ministry of Education and Vocational Training (MoEVT). Accessed February 3, 2019 http://www.moe.go.tz/index.php

[23]. Yilmaz, N.P. (2011). Evaluation of the Technology Integration Process in the Turkish Education System. **Contemporary Educational Technology, vol.2, no.1, pp. 37-54, 2011**