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Challenges in ICT Integration in Ethiopian Education a Survey Study

Hailye Tekleselase

University: Wolaita Sodo University

Abstract: *Information Communication Technology (ICT) integration in the classroom is often viewed as a solution towards resolving Ethiopian's education challenges. However, ICT integration in education in Ethiopia has been severely restricted by functioning, tactical and pedagogic challenges as well as lack of ICT infrastructure and shortage of qualified Teachers besides students does not have interest to learn. In part, addressing the strategic and operational challenges encompasses understanding the current background of ICT integration in schools. There is inadequate information on the practical enforcement of ICTs in the classroom. The objective of this research is to determine the extent of ICT usage in Ethiopian schools in order to obtain an understanding of the practical enforcement of ICTs at the school level. This study combines both qualitative and quantitative data collection methods in order to provide a rich distinction perspective of ICT integration in Ethiopian schools. The study indicated that the acceptance of technology remains low, on average the frequency of usage per tool type was as follows: contextual tools (34%), sharing information and ideas tools (12%), experiential tools (19%) and reflective dialogue tools (13%). It was found that teachers are uncertain with respect to the implementation of e-education while being filled by poor infrastructure and lack of skills.*

Keywords: information communication technology, education, integration

1. INTRODUCTION

The term Information and communications technology(ICT) encompasses all sorts of computing and communicating tools and techniques such as the computers, software's, networks, satellite links and related systems that allow people to access, analyze, create, exchange and use data, information and knowledge in ways that were almost imaginable (Association of African Universities, 2000).

Digital technologies are electronic tools, systems, devices and resources that generate store or process data. These include social media, online games and applications, multimedia, power points, productivity applications, cloud computing, interoperable systems and mobile devices. All tools and techniques of ICT including both the former ICT tools and the recent technologies, have got paramount role in all aspects of human life such education, business, health, transport, entertain Education is one of the main keys to economic development and improvements in human welfare.

As global economic competition grows sharper, education becomes an important source of competitive advantage, closely linked to economic growth, and a way for countries to attract jobs and investment. In addition, education appears to be one of the key determinants of lifetime earnings. Countries therefore frequently see raising educational attainment as a way of tackling poverty and deprivation. Education offers a way to improve and update the skills and capabilities of the workforce. The role of integrating ICT's in the education sector can be examined in different ways such as reducing the costs, improving the efficiency of administration and the teaching learning, etc. thereby creating more opportunities for an efficient and effective way of handling their businesses.

2. LITERATURE REVIEW

The integration of ICTs in education offers several benefits: sharing of resources and learning
environments as well as the promotion of collaborative learning and a general move towards greater learner autonomy (Eze, Adu, & Ruramayi, 2013). However, technology integration is more than providing computers and an internet connection; it contains the instantiation of learning activities with pedagogically informed use of ICT tools (Mereku & Mereku, 2015).

Studies show that few educators have effectively integrated ICTs in the classroom (Nkula & Krauss, 2014; Padayachee, 2016). The following digital tools have been cited with respect to ICT integration in the classroom: word processors, data projectors, Power point spreadsheets, search engines, interactive whiteboards, mobile technologies, smart phones (emails, blogs, videos etc.), tablets, instant messaging, podcasts, CD-ROMs, Wikipedia, simulations, animations and e-books (Mooketsi & Chigona, 2014; Mereku & Mereku, 2015; Assan & Thomas, 2012; Lorenz, Banister, & Kikkas, 2015; Batchelor & Olakanmi, 2015; Govender & Govender, 2014; Molotsi, 2014; Tamim, Borokhovski, Pickup, & Bernard, 2015). Accordingly, these studies do indicate that ICTs are being used in the classroom; however, more in-depth knowledge is required towards understanding the categories of technologies used and how this facilitates pedagogy and content knowledge.

Computer and the Internet affected the educational process more than the previous educational technologies. Integration of ICT in education facilitates both instructional and learning processes. In addition to audio and visual sense, computer and Internet activate the sense of touch of the user as well and provide the opportunity of higher interaction to the users for the development of their individual, creative, and intellectual abilities.

Advanced forms of ICT assisted instruction including computers and Internet assisted instructions require proper infrastructure including substantial computers and Internet resources. The lack of ICT resources and poor infrastructure prevent the full implementation of ICT in education. There are many challenges regarding the integration of ICT particularly in developing countries. ICT in education in Ethiopia is a challenge as infrastructure is neglected particularly in its remote areas.

Contribution of this paper to the literature

Students have computers and Internet facilities at home and schools. They believe that the use of ICT supports their learning. However, they spend more time on computers for entertaining and other purposes than for academic purpose. Students are expert at simple skills like MS Word, MS Power Point, Searching and Browsing at Internet, Social networking, Email, File attachment, and Computer games but are less skilled or poor on other skills like using digital library, discussion forums, and Blogs. Slow speed of computers, signal problem in Internet, virus threat, poor working condition of computers, load shedding, and lack of access of Internet are the problems faced by the majority of the students.

3. RESEARCH QUESTION

i. What are the most frequent types of ICTs used for teaching and learning?
ii How are teachers integrating ICTs into pedagogical and content knowledge?
iii What is the ICT-related vision of teachers and how does this transform into pedagogical and content knowledge?

Conceptual framework

From Koehler and Mishra (2009)'s perspective, the successful integration of ICT in the classroom must consider three components: content knowledge (i.e. knowledge of subject matter), pedagogical knowledge (i.e. knowledge of teaching and learning praxis) and technological knowledge (i.e. technical skills). The intersection between them is known as Technological Pedagogical Content Knowledge (TPACK). There are very few tools that hit the 'sweet spot' of TPACK (i.e. a perfect confluence of technology, pedagogy, and content) which should always be the goal of e-education. While it has been suggested that it is necessary for teachers to acquire the knowledge bases of TPACK (Nkula & Krauss, 2014; A. Chigona & Chigona, 2013), Padayachee and Mbati (2016) suggest that envisioning the model from a pragmatic perspective such as active learning can be more meaningful to show how 'ICT engages the constructive dimension within active learning' (Koh, 2013, p. 889) due to the convoluted nature of the model.

4. RESEARCH METHODOLOGY

As there is scant research on the subject matter, an exploratory research design was proposed using a combination of quantitative and qualitative data collection methods. A non-experimental exploratory survey methodology was designed.

4.1. Sampling

The researcher generated a purposive sample of teachers across all disciplines from the selected (n=64) secondary schools in south nation. The sample will not naturally permit generalizations outside the group of sample elements which belies the intent of the study. The sampling strategy represented a combination of convenience and purposive sampling. As a convenience sampling method was followed, the City of wolaita sodo which is located in the south people of Ethiopia were selected as a possible target population based on accessibility and closeness. The purposive sampling criteria considered a confluence of relatively high access to the internet and top performing secondary schools as this may generate best case scenarios of ICT integration in education.

4.2. Data collection

The data collection was completed within a two-month period. Principles of beneficence and respect for human dignity were observed during data collection. The participant's right to confidentiality was

School	N	Response rate	Grades
Lika	68	56%	7-12
Ligaba	86	47%	7-12
Chora	58	39%	5-10

Table 1: Response rates achieved

5. RESULTS

Relative tools

The level of awareness of relative tools is summarized in Table 1. Teachers appear to have the least awareness regarding interactive whiteboards; however teachers appear to have high levels of awareness of mobile phone and data projectors. The relative usage frequency and the relative importance of contextual tools are summarized in Table.

The least frequently used tools are the interactive whiteboards while the most commonly used tools are black board and chalk this is surprise in 21st century in Africa.

Table 2. Availability of ICT resources

ICT tools	F	%
Laptop	17	5.8
Internet	103	11.3
Printer	5	1.5
Mobile	850	82.7
Web browser	492	63.9
Computer	64	23.5

Table 2 show that the majority of participants have mobile and Internet. Majority of the students (82.7%) have mobile phone. However, printers and scanners are not available to the students.

ICT skills among the students of high school

Students were provided with a list of computer skills and programs so that they can show the level of knowledge on these on 5 point likert type scale. Results are presented in the Table 2 blow.

Table 3. Participants' level of expertise at different programs

No	Program	M	SD
1	MS Excel	2.98	1.11
2	MS Word	2.67	1.21
3	MS Power Point	3.43	1.26
4	SPSS	2.8	1.45
5	Searching/Browsing at Internet	3.95	1.07
6	Computer games	3.66	1.55
7	Social networking	4.24	1.15

Table 3 shows that the participants are good at some educational and entertaining ICT related skills and programs like MS Word, MS Power Point, Searching and Browsing at Internet, Email, File attachment, Social networking, and Computer games. Results showed that students have moderate level of skill at using MS Excel, and using digital library and are poor at using programs like Blogs, and SPSS.

Table 4. Availability of software tools

No	software tools	M	SD
1	Search engines	2.98	1.11
2	Spreadsheet software	2.67	1.21
3	Educational computer games	3.43	1.26
4	Virtual labs	2.80	1.45
5	Online examinations/tests	3.95	1.07

Table 4 shows that the participants are good at search engine Browsing at Internet, Email, File attachment, Social networking, and Computer games. Results showed that students have moderate level of skill at using, Spreadsheet software and using digital library and are poor at using programs like, Virtual labs and Educational computer games.

Table 5. Problems of students while using computer/Internet

Problem	f	%
Lack of access of Internet	86	83.8
Poor working condition of computers	64	78.3
Non availability of the require software	34	45.2
Lack of technical support	5	80.5
Virus threat	22	38.1
Slow speed of computers	32	77.5

Table 5 shows that the most important problem participants reported regarding the use of ICT at schools Poor working condition of computers (78.3%). About 70.4% of the participants face this problem at school as well. Second important problem faced by the students at computer lab is the non-availability of the require software (45.2%). About 38.1% participants face this problem at school. Other problems participants face virus threat (38.1), signal problem in Internet (77.5), slow speed of computers (77.8), lack

of access of Internet (83.2), lack of technical support (25.2), and poor working condition of computers (78.3). At university, students face the problems of slow speed of computers (83.6%), signal problem in Internet (76.4), virus threat (74.0), poor working condition of computers (72.8), lack of access of Internet (62.8), and lack of technical support (47.2). In open ended question, about 19.6% participants responded and the two problems reported by participants were window corrupt (12.8%) and occasional held of computer (6.8%).

6. DISCUSION

With regard to the first research question, we found that the most frequently used contextual type tools included black board and Chalk especially non –ICT course like history, language, geography biology physics and chemistry. Only, 5.8% of teachers have never used a data projector and 84% have indicated that they have never used laptop. These tools are considered to be relatively important and teachers have a high level of awareness of these types of tools. In terms of experiential tools: search engines feature as predominant tools. Teachers have a high degree of awareness of search engines and a high level of importance is attached to them. Only 13.2% of teachers have never used a search engine. With respect to tools used to share information and ideas, word processors and presentation type tools are used most often. Only 7% of teachers have never used a word processing package, while only 11.3% have never used presentation type software. It appears that online video sharing sites such as YouTube are also popular. With respect to reflective dialogue tools; mobile learning tools and social media tools proved very popular. A minority of teachers (only 30%) indicated that they never use a mobile learning tool while 45% indicated that they never use a social media tool. These tools are sufficient to use for technology-enabled active learning in the classroom. Hence it may be a useful investment to capitalize on the teachers' existing knowledge bases rather than to introduce new and unfamiliar technologies.

With regard to the second research question in terms of how teachers are integrating ICT in their teaching, it was found that a variety of creative approaches were offered. YouTube can be used for a variety of subjects ranging from mathematics and music to literature. Google is useful for supporting lessons with facts, riddles, audio, and images. Mobile devices can be useful for sharing resources and communication. Teachers appeared to use ICTs more frequently in their preparation and administration. The possible explanation for this is that teachers have the infrastructure at home for those purposes, but not at school only for entertaining.

With regard to the third question in terms of the ICT-related vision of educators, the most coded terms which were extracted included search engines, video, interactive whiteboards, e-learning platforms, data projectors, PowerPoint, mobile and online assessments. These tools lean towards using sharing information and ideas and contextual tools which are geared more towards passive learning.

Extant studies (Nkula & Krauss, 2014; Msila, 2015) impute the lack of self-efficacy of teachers for the slow progression to ICT integration in the classroom. The current study also highlighted this issue, however, it was minor in comparison to other barriers raised. Analogous to previous studies (Mooketsi & Chigona, 2014; Mereku & Mereku, 2015; Assan & Thomas, 2012) teachers are comfortable with using the internet and word processors to prepare their lessons. Govender and Govender (Govender & Govender, 2014) found that aspects such as web design, electronic resources and discussion groups, email and electronic references are not widely used, which is consistent with the findings of the current study. Mereku and Mereku (Mereku & Mereku, 2015) found that educators do not use ICTs to communicate with their students except for those learners who are specifically studying Information Technology as a subject. However, in this study it was found that a large proportion of teachers from various subject areas used mobile learning applications and social media for communication. The ubiquitous nature of mobile phones and social media may be propelling this form of communication amongst teachers across all fields.

7. CONCLUSION

There appears to be a misconception that merely providing technology can transform education. It is clear that the challenge not only lies with how to use the technology but also with how to integrate digital technologies effectively into the curriculum. The objective of this study was to identify the categories of media, e-learning tools and digital devices already being used that may influence further ICT integration by capturing a snapshot of teachers' existing practices. This study drew on the experiential accounts of teachers. The outcomes of the study are likely to be of significance to researchers, teachers and policy makers. Fu+ture research will involve deriving a framework of practical guidelines based on technology-based active learning to support educators in achieving effective ICT integration into their teaching practices.

REFERENCES

Adeosun, O. (2010). Quality basic education development in Nigeria: Imperative for use of ICT. Journal of International Cooperation in Education, 13(2), 193-211.

Adu, E. (2016). E-Learning facilities usage assessment by Economic and Management Science (EMS) teachers in Eastern Cape province, South Africa. In EdMedia: World Conference on Educational Media and Technology (pp. 1738–1744). Association for the Advancement of Computin.

Adukaite, A. (2017). Teacher perceptions on the use of digital gamified learning in tourism education: The case of South African secondary schools. Computers & Education, 111, 172–190.

al, K. K. (2013). Adopting the integrative model of behaviour prediction to explain teachers‟ willingness to use ICT: A perspective for research on teachers‟ ICT usage in pedagogical practices," Technology, Pedagogy and Education.

Assan, T. (2012). Information and communication technology integration into teaching and learning: Opportunities and challenges for commerce educators in South Africa. International Journal of Education and Development using Information and Communication Technology.

Ayub, A. (2014). Use of internet for academic purposes among students in Malaysian institutions of higher education. The Turkish Online Journal of Educational Technology.

B. Somekh. (2013). "Understanding the use of interactive whiteboards in primary science," Australasian Journal of Educational Technology, vol. 29, no. 2, pp. 217-232.

Batchelor, J. (2015). Preparing teachers to integrate tablet computers into teaching and learning. In IST-Africa Conference.

Cantoni, L. (2017). Teacher perceptions on the use of digital gamified learning in tourism education: The case of South African secondary schools. Computers & Education, 111, 172–190. *JIS*, 20-80.

Jung, I. (2005). ICT-Pedagogy integration in teacher training: Application cases worldwide. Educational Technology & Society, 8 (2), 94-101. .

Msila, V. (2015). Teacher readiness and Information and Communications Technology (ICT) use in classrooms: A South African case study. Creative Education, 6(18), 1973.https://doi.org/10. 4236/ce.2015.618202 .

Msila, V. (n.d.). Teacher readiness and Information and Communications Technology (ICT) use in classrooms: A South African case study. Creative Education, 6(18), 1973.https://doi.org/10. 4236/ce.2015.618202 2015.

Padayachee, K. (2016). A guiding vision of technology-enabled active learning: A South African perspective. In 2016 Annual Global Online Conference on Information and Computer Technology (GOCICT), Louisville, KY, USA. .

UNESCO. (2014). Information and communication technology (ICT) in education in Asia: A comparative analysis of ICT integration and e-readiness in schools across Asia.

Vandeyar, T. (2013). Practice as policy in ICT for education: Catalysing communities of practice in education in South Africa. Technology in Society, 35(4), 248–257.

Youssef, A. (2008). The impact of ICT on student performance in higher education: Direct effects, indirect effects and organisational change. RUSC. Universities and Knowledge Society Journal, 5(1), 13. .