EMBRACING INFORMATION AND COMMUNICATION TECHNOLOGIES IN ZIMBABWE: A CHALLENGE FOR TEACHER EDUCATION

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Abstract:

The 21st century has seen Information and communication technologies (ICT) becoming commonplace entities in all aspects of life and especially the cornerstone in teacher education in Zimbabwe. The use of ICT in education lends itself to more student-centred learning settings. But with the world moving rapidly into digital media and information, the role of ICT in teacher education is becoming more and more important and this importance will continue to grow and develop in the 21st century. The integration of information and communication technology (ICT) in teacher education provides more opportunities for student teachers to work better in an information age. However, some barriers may discourage student teachers to fully enjoy the merits of ICT usage. Examining the barriers for using ICT in teacher education can assist the educators to overcome the obstacles and integrate the ICT in everyday education. This case study of three teachers colleges in Masvingo province aims to investigate the student teachers' perceptions of the barriers and challenges preventing teachers to integrate ICT in their training.

Key words: Information and communication Technology, teacher training,

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1.0 Contextual background

1.1 Introduction

This paper starts by examining critical terms to the research, as well as highlighting global and Zimbabwean trends in ICT usage in teacher training. The paper also gives a description of the research design, presents and discusses findings, draws conclusions and finally makes recommendations.

1.2 Theoretical framework

This study utilised the adult learning theory by Knowles (1970). According to this theory, adults spend a considerable amount of time and energy exploring what the benefits are of them learning something and the costs of them not learning something before they are willing to invest time in learning it. It is seldom convincing for them to be told by someone (even the boss) that it would be good for them. According to this theory, training should be based on valid needs of the intended audience. Knowles (1970) advances that, all information provided about the training; including lesson plans should include reasons for learning. The benefits of learning should be clearly shown. Activities should be based around real work experiences. Andragogy emphasises the value of the process of learning. It uses approaches to learning that are problem-based and collaborative rather than didactic, and also emphasises more equality between the teacher and learner. Andragogy as a study of adult learning originated in Europe in 1950's and was then pioneered as a theory and model of adult learning from the 1970's by Malcolm Knowles an American practitioner and theorist of adult education, who defined andragogy as "the art and science of helping adults learn" (Zmeyov 1998; Fidishun 2000).

1.3 ICT and Teacher Education

It is indisputable that technology has become heavily integrated in everyday life and there is no escape (Runyowa and Jenjekwa, 2013).Worldwide research has shown that ICT can lead to improved student learning and better teaching methods. In Zimbabwe, the government is investing heavily in information and communication technology for use by teachers and pupils. However, although teachers' colleges have had computers in lecture rooms for almost two decades, ways to use them effectively have evolved slowly and patchily.

UNESCO (2002) argues that: For education to reap the full benefits of ICTs in learning, it is essential that pre-service and in-service teachers have basic ICT skills and competencies. Teacher education institutions and programmes must provide the leadership for pre-service and in-service teachers and model the new pedagogies and tools for learning. They must also provide leadership in determining how the new technologies can best be used in the context of the culture, needs, and economic conditions within their country. Teacher education institutions also need to develop strategies and plans to enhance the teaching learning process within teacher education programmes and to assure that all future teachers are well prepared to use the new tools for learning.

The potential of ICT to impact on teaching creates the opportunity for teachers to make changes. These changes involve learning how to use new ICT and changing how they teach to enable the incorporation of ICT into their teaching .Teachers do not always make these changes, though they can see the potential of ICT in the classroom, they may focus on using skill-based applications which slide into their existing view of teaching and learning. Embracing ICT in teaching and learning is a leap in the right direction for educators.

Khalid (2009) asserts that the use of ICT in the classroom is very important for providing opportunities for students to learn to operate in an information age. Modern technology offers many means of improving teaching and learning in the classroom (Lefebvere, Deaudelin & Loiselle, 2006).Dawes (2001) confirms that new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have not been possible before. Khalid (2009) states that due to ICT's importance in society and possibly in the future of education, identifying the possible obstacles to the integration of these technologies in schools would be an important step in improving the quality of teaching and learning. Wong et al (2006) point out that technology can play a part in supporting face-to- face teaching and learning in the classroom. According to Grabe and Grabe (2007), technologies can play a role in student skills, motivation, and knowledge.

Thus, education in most parts of Zimbabwe has evolved under the influence of technology and it is now inevitable students need to be reached through online classrooms, e-mail, e-libraries and

e-learning.ICT experts say technological advancements in education come with improved quality of teaching and learning. It assists teachers to streamline routine tasks while improving student assessment and data collection. The experts further say that students today use technology to take a more active role in personalising their own education while teachers act as facilitators of knowledge rather than knowledge transmitters. In Zimbabwe, the era of improving ICT in schools gained momentum at the turn of the new millennium with President Mugabe leading through the Schools Computerisation Programme. The initiative has been embraced by many schools that have gone further to establish computer laboratories. However, with teachers' colleges joining the international migration towards ICT, educationists say it is worrying to note that the development is not commensurate with local investments to equip the student teachers.

1.4 ICT Policies in Zimbabwe

According to Isaacs (2007), the Zimbabwean government adopted a national ICT policy in 2005 that was informed both by a Harvard University-guided e-readiness survey, which suggested the country was not uniformly e-ready, and by a host of preceding general and sectoral policies including Vision 2020, the national science and technology policy adopted in 2002, and the Nziramasanga Education Commission Report which in 1999 recommended the promotion of the educational use of computers for teaching and learning in educational institutions. produce knowledge workers and qualified human resources, to establish relevant structures and institutional mechanisms to promote ICTs, and to encourage equitable access to ICTs across genders and to youth, the elderly, and people with disabilities It also has a separate section on human resource development where it promotes skills training and capacity-building at all levels in the private and public sectors and in all training centres and institutions of learning.

The policy's vision is to transform Zimbabwe into a knowledge-based society by 2020, while its mission is to accelerate the development and application of ICTs in support of economic growth and development.

1.5 Barriers for Using ICT in teacher education

The process of using ICT in everyday education is very complicated. The opportunities provided by ICT to support teaching and learning are not problem-free. The virtually limitless

opportunities of access to information in an educational context can pose a real danger of information overload if the teachers do not have the skills in filtering information for relevance, or are unable to establish a coherent organizing principle. Both students and teachers may lack the necessity skills to access, process and use information. Even there are a number of difficulties which act as barriers and prevent teachers to integrate ICT into the classroom. According to Musarurwa (2012), the teacher trainees have a dual role to play: learning through ICTs and also learning how to teach through them.

1.6 ICT Infrastructural Development in teacher training Institutions

Musarurwa (2012) confirms that, the provision of ICT resources to the education sector in Zimbabwe has been growing in leaps and bounds since 2002. The Zimbabwean government developed a national ICT policy in 2005. According to Isaacs (2007), the policy was informed both by a Harvard University-guided e-readiness survey, which suggested the country was not e-ready, and by a host of preceding general and sector policies that included the Nziramasanga Education Commission Report of 1999, the national science and technology policy of 2002 and vision 2020. In particular, the Nziramasanga Commission recommended the use of computers for teaching and learning in educational institutions. The National ICT policy that was adopted in 2005 makes significant references to the promotion of ICTs in education including their pedagogical use in educational institutions (Isaacs, 2007, p. 2). President' office also launched a campaign to provide most schools with computer related equipment. This resulted in most schools (including schools in the remote areas of the country) and universities benefitting and thus enable them to utilise ICTs in the teaching and learning process, although an audit still needs to be carried out to ascertain how far the equipment has been put to good use. However, this campaign created a mismatch in the provision of IT resources. It is the extreme ends of the education sector that were capacitated leaving middle but essential departments, particularly Teacher Education Colleges, as well as Polytechnic Colleges not catered for. Teacher Education Colleges were the worst hit, since they are essentially a service sector that also cannot raise any extra income to help themselves survive. It is precisely for this reason that a nongovernmental organisation, VVOB5 (Vlaamse Vereniging voor Ontwikkelingssamenwerking en Technische Bijstand), carried out a needs analysis survey and identified a gap in the use of ICTs in teaching

and learning at Teacher Education Colleges and Polytechnics in Zimbabwe, which it decided to roll out a programme that came to be known as the CITEP (College IT (information technology)

1.7 Research Design

This research adopts the qualitative research design. Qualitative research is a broad approach to the study of phenomena. This study explores the perceptions of student teachers on the use of ICTs in teacher education. The qualitative design is appropriate in this study for it grants the researchers opportunity to look at context and social meaning and how these affect individuals and is grounded in use of words, phrases, sentences and paragraphs to describe phenomena.

1.8 Data Collection

The research made use of in depth formal and informal interviews. Participants from the three colleges were interviewed about their perceptions on the challenges and barriers of ICTs in teacher education. For ethical reasons all the participants were informed about the research. 30 students, 10 from each of the three colleges in Masvingo had their views collected through in depth interviews. Nine ICT lecturers were also interviewed three from each of the colleges.

1.9 Findings

1.9.1 Infrastructure development

The dilemma which arises in providing educational technology stems from a lack of financial resources and a limited distributive capacity. All the visited colleges had a room devoted as the computer laboratory where students take their lectures. The colleges have at least 30 computers in the laboratory. One student noted that "*the student computer ratio is so high that we are normally congested in the laboratory". "The resources are not adequate to cater for students from varying backgrounds as well as the ever increasing enrolments".* The space reserved for the laboratories is small compared to the student enrolments. All the visited colleges were using desk tops with a windows 7 version. Students noted that the hardware components provided for by colleges were not adequate creating a mismatch with the students' huge enrolments. On average hardware components of a full set which makes a computer costs an average of $600.Students are put into learning groups and these are taught in one hour weekly sessions which combine theory and practical.

1.9.2 Government support

The government has invested heavily in the area of information and communication technology. The participants said the government should play a more active role in terms of policy

formulation and promoting acquisition of ICTs for colleges. Government support has been riddled by an economic downturn. The President has donated a few computers to one of the colleges. *"The government should play a more leading role in spearheading the ICT programme" "The government is cash strapped and may not put ICT issues as a number one priority when millions of citizens are starving."*Participants noted that although the government had an ICT policy in place, little had been done on the government side to promote use of ICTs in teacher education. "*Government should walk the talk".* Participants noted that the government should step up financial support and resource mobilisation into teacher education. Student teachers should get requisite technological skills during their training.

1.9.3 ICT Lecturers shortage

Lecturers conduct lessons and are responsible for content delivery and mastery. The three colleges are manned by a maximum of three lecturers per department. The lecturers also mark assignments, tests and examinations. Students felt, there was a critical shortage of ICT personnel hence compromising service. *"One is easily overwhelmed by the workload and the student lecturer ratio is so high"*. Hired lecturers in this field do not stay long enough as most of them pursue for greener pastures while those that have the courage to stay are overwhelmed by heavy workloads. Students complained that the student –lecturer ratio is too high thus compromising standards. "*Quality here is definitely sacrificed*", noted one participant.

1.9.4 Limited time

Adequate time must be allowed for student teachers to develop new skills, explore their integration into their existing teaching practices and curriculum, if ICTs are to be used effectively. Students in the visited 3 colleges said they do ICT lectures once a week. The lecture lasts only an hour being either theory or practical or a combination of both. Majority of the students revealed that a reasonable number of students only encounter a computer at college making it difficult for them to grasp all the taught packages difficult. "*I can hardly use a computer without the assistance of a helper". "The teacher education curriculum is loaded with numerous study areas which amount to over sixteen courses"*

1.9.5 Electricity outages

Although all the colleges are connected to electricity; Zimbabwe experiences regular power outages. *"Sometimes a lecture fails simply because there is no electricity"* Black outs are a

common feature in the 3 colleges thus hampering service delivery. Power outage also means no internet connectivity. The generators that the colleges have do not have the capacity to sustain their laboratories. The students also noted that sometimes the colleges do not have fuel for the generators. *"It is even worse during the rainy season electricity is problematic"*

1.9.6 Broken down computers

All the three colleges do not have resident computer technicians to service their machines on time. They hire external technicians who sometimes take their time before responding to reported technical issues. Some faults go beyond the knowledge of the technicians. *"It is very difficult to get all the computers in the laboratory all working well at any given moment, breakdowns are very common"*

1.9.7 Internet connectivity

The participants revealed that most of the time colleges are not able to connect to the World Wide Web, due to the high costs involved in the connectivity. On average, it may cost approximately $1200 per month to connect to about 30 computers on an unlimited platinum bandwidth. This is considered as very expensive for a very slow speed. Students noted the internet speed is slow and sometimes connectivity is absent due to non-payment of exorbitant bills by colleges. The libraries are not also linked to other online libraries.

1.9.8 Attitudes of students

Few student teachers are confident in using a wide range of ICT resources, and limited confidence hinders the desire to use ICTs. "*Vamwe computer todzionera kuno*" (we are exposed to computers here at college).Majority students interviewed had only started using a computer when they enrolled at college. These students expressed a kind of phobia when it comes to using computers in the teaching and learning process. The country's teacher training module is seen as lagging behind on the requisite ICT training before the teachers are released to the schools. Observers say the situation is worse in high schools where the teachers have been found wanting in front of students who come from family backgrounds that expose them to gadgets such as the computer.

1.10 Discussion and findings

This study has raised critical issues which relate to barriers and challenges faced by Zimbabwean teachers' colleges in embracing ICT in the teacher training programme. It is evident that in cooperation of ICTs in teacher education though noble still has hurdles to surmount. The critical

stakeholders indicated their reservations about the programme because of a number of challenges among them the lack of adequate qualified lecturers in the area of ICT. The few present lecturers either have a diploma or degree in Information Technology with no teaching qualification. Few of the lecturers have both the teaching and the I.T qualifications. All the three colleges are experiencing staff exodus especially in this area. The Ministry of Higher and Tertiary Education has labelled this a critical area. Present remuneration packages in the Ministry are not attractive enough to attract and retain competent staff. Lecturers also are made to bear huge workloads considering that all the colleges have an average of over 400 students per intake.

In all the visited colleges, there is clear evidence that infrastructural development in the area of ICT is seriously lagging behind. The student-computer ratio in teachers' colleges is too high. On average, two intakes with an enrolment of about 450 each are on campus at any given moment. This gives a total of about 900 students. The colleges have 50 computers each reserved for teaching and learning. The student-computer ratio therefore is about one computer to 18 students. The University of Zimbabwe which is the certification institution of these colleges recommends a ratio of 8 to 10 students per computer. The colleges also have serious space shortages to house the hardware equipment.

The participants also noted with concern power outages and lack of power back up measures in all the teachers' colleges. The available generators are too small to service the ICT laboratories or are sometimes starved of fuel during lectures. The colleges also have no resident technicians to service the computers on time in case of breakdowns.

What is equally worrying is the lack of serious efforts by government in the provision of ICT resources in teachers' colleges. Only one college had received 20 computers from the good will of the President. The computers for the programme were sourced through private donations to the Head of State from well-wishers and from his friends some of whom are Zimbabweans.

The 2-5-2 model of teacher training whereby students spend two terms on campus 5 on teaching practice and the last two on campus is not an effective model. The model does not afford student teachers adequate time for hands on approach with the technologies. Most students during their teaching practice are deployed in rural areas where ICTs do not exist at all. The lecture periods

are short, one hour sessions per week are not enough to cater for all the students who come from vast backgrounds and have diverse learning capacities.

Educational trends are changing and integration of ICTs in teacher education is one way geared towards providing quality educational foundation to student teachers. All concerned stakeholders need to fully through their weight into this endeavour until it reaches fruition. The 21st century is a technological era and Zimbabwe should embrace technological advancements in the teacher education programme.

1.11 Definition of key terms

1.11.1 Information and communication Technology

Information and Communication Technologies (ICTs) are often associated with the most sophisticated and expensive computer-based technologies. But ICTs also encompass the more conventional technologies such as radio, television and telephone technology. While definitions of ICTs are varied, it might be useful to accept the definition provided by United Nations Development Programme (UNDP): 'ICTs are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' ICTs of radio, television and telephone, and the 'new' ICTs of computers, satellite and wireless technology and the Internet. These different tools are now able to work together, and combine to form our 'networked world' – a massive infrastructure of interconnected telephone services, standardized computing hardware, the internet, radio and television, which reaches into every corner of the globe'. When we talk of ICTs, we refer not only to the latest computer and Internet based technologies, but also to simple audio visual aids such as the transparency and slides, tape and cassette recorders and radio; video cassettes and television; and film.

These older and more familiar technologies are referred to under the collective heading of "analogue media" while the newer computer and Internet based technologies are called the "digital media". However, in today's world, with the increased convergence or blending of the engineering designs and with the coming together of the satellite and the computer, the dividing lines between these different media are becoming blurred and consequently, the way people define and refer to ICTs is also getting blurred. Often, the definition of ICTs is also done in terms of "old" and "new" as if to distinguish between the analogue and digital. But what is "old and

what is "new"? Livingstone (1999), in an extensive exploration of the idea of newness, has argued that the notion of "new" can either be seen with reference to the "newness of technology" or in the context of "what's new for society" about these media. Livingstone further argues that what is new for the western world is not necessarily so for the rest of the world. Within a social context, the introduction of radio or television may be as "new" as the introduction of Internet. While there is much euphoria about the ICTs, after more than half a century of research, social scientists are still sceptical about tall and ill defined claims about potential societal changes that may follow a technological innovation. This means that 'new" cannot merely be defined either in terms of time and time scales or in terms of the technology innovation.

1.11.2 Teacher Education

Teacher education refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitudes, behaviours and skills they require to perform their tasks effectively in the classroom, school and wider community. According to UNESCO (2005), teacher education "addresses environmental, social, and economic contexts to create locally relevant and culturally appropriate teacher education programmes for both pre-service and in-service teachers."

Teacher education generally includes four elements: improving the general educational background of the trainee teachers; increasing their knowledge and understanding of the subjects they are to teach; pedagogy and understanding of children and learning; and the development of practical skills and competences. The balance between these four elements varies widely (Perraton, 2010).

Also, Teacher Education Institutions have the potential to bring changes within educational systems that will shape the knowledge and skills of future generations. Teacher education institutions serve as key change agents in transforming education and society, so such a future is possible.

1.12 Recommendations

- The introduction of ICTs in education challenges teachers in relation to their technical ability, knowledge and expertise in the use of ICTs. Inadequate operational knowledge as is a practical reality in Zimbabwean teachers colleges. If the student teachers or lecturers are to use technology effectively in helping students achieve high academic standards they must possess the technical ability, knowledge and expertise in the use of ICTs.

Secondly attitudes and degrees of ability and willingness to adapt to and use ICTs should be addressed as a matter of serious urgency.

- Teachers' colleges in Zimbabwe should infuse technology into the entire teacher education program. Throughout their teacher education experience, students should learn about, learn with, and learn to incorporate technology into their own teaching of the primary school curriculum. Restricting technology experiences to a single course, or to a single area of teacher education, such as the methods courses, will not prepare students to be technology-using teachers. Pre-service teacher education students should learn about a wide range of educational technology across their professional preparation, from introductory and foundations courses to their student teaching or professional development experiences.
- Information and Communication Technology should be introduced in context in all teachers training colleges**.** Teaching pre-service students teachers basic computer literacy, the traditional operating system, word processor, spreadsheet, database, and access is not enough. As with the teaching profession, there is a level of literacy beyond general computer literacy. This more specific or professional literacy involves learning to use technology to foster the educational growth of student teachers. Professional literacy is best learned in context. That is, pre-service students should learn many uses of technology because they are integrated into their coursework and teaching practice experiences. They should see their lecturers and mentor teachers modelling innovative uses of technology; they should be expected to use it in their own learning, and they should have ample opportunities to explore creative uses of technology in their own teaching. Pre-service teachers should be exposed to regular and pervasive modelling of technology by pre-service teacher educators, content specialists, and mentor teachers. In addition, provision of opportunities for pre-service students to teach with technology in classrooms is critical. This becomes the spring board for educational success.

- Students should experience innovative technology-supported learning environments in their teacher education program. Technology can be used to support traditional forms of learning as well as to transform learning. A Power Point presentation, for example, can enhance a traditional lecture, but it does not necessarily transform the learning experience. On the other hand, using multimedia-cases to deal with topics that have previously been addressed through lectures may

well be an example of a transformed learning experience that is supported by technology. Students should experience both types of uses of technology in their program. However, the brightest promise of technology in education is as a support for new, innovative, and creative forms of teaching and learning.

- Most teacher education faculty members are interested in including technology in their teaching, but they are unfamiliar with the ways this can be accomplished. There are "islands of excellence" in teacher education but the approaches and innovations developed in cutting-edge programs are not widely known. Another way of facilitating dissemination of this expertise is to encourage the development of coalitions of teacher education programs that share expertise and resources.
- The government needs to establish national centres for technology and teacher education that disseminate current knowledge, develop new knowledge, and coordinate the creation of electronic tools and materials for teacher education. One center should also be a Clearinghouse for Teacher Education Tools that serves as a means of disseminating software and other materials developed specifically for teacher education.

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