Teaching Information and Communication Technology (ICT) in Zimbabwean Polytechnical Colleges: Success and Challenges

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Abstract

The aim was to investigate the success and challenges of Information Communication Technology (ICT) in Zimbabwean Polytechnics. The study was guided by the objectives that included assessing the success in common computing skills levels among the staff and students, investigating levels of usage of ICT skills adoption and integration between students and staff, and to investigate the challenges in ICT skills adoption and integration between staff and students. Relevant literature was covered in chapter two. The literature was presented by referring to different researchers that wrote on challenges of ICT adoption and integration in the form of constructive argument by the aid of authors in support and those against. The research adopted interprevist research philosophy he target population of the study constituted 220 employees of the polytechnics and was reduced to 140 making use of sample size determination model by Krejice and Morgan. Operating systems, word processing, spreadsheets, presentation software, and use of the internet were the common computing skills level among the staff and students. Frequency use of ICT tools in teaching and learning, frequency use of computers and the Internet for teaching and learning purposes, mandatory use of computers for teaching and learning, students being conversant with the use of ICT tools, and having a college budget to support ICT skills development determined the levels of usage of ICT skills adoption and integration between students and staff. The challenges in ICT skills adoption and integration between staff and students were lack of funding from the government and stakeholders, improper ICT infrastructure, expensive hardware and software costs and lack of skills and expert knowledge. The recommendations of the study were that the institutions should upgrade their ICT infrastructure and resources in order to maintain the success in computing skills level of staff and students, come up with short computer courses with diverse computer packages to enhance the level of ICT skills usage of staff and students and identify critical needs in the community and come up with potential projects to sustain themselves and build a reliable ICT infrastructure.

Keywords: Teaching, information and communication technology, challenges

INTRODUCTION

In this 21st century Information and Communication Technology (ICT) has been viewed by many education systems across many countries the world over as a powerful tool to improve teaching and

learning. Evidence of past researches have been conducted on barriers in ICT adoption and integration in institutions that include secondary schools, vocational training centres and colleges. In a research conducted by the Nziramasanga Commission Report (CIET, 1999) and National Science and Technology Policy (2002) were two key strategies launched by the Zimbabwean government to improve the use of ICT in schools and colleges. In addition, ICT was implemented in learning institutions to revolutionise teaching and learning processes and improve instructional tactics (Kozma, 2011; Sunkel, 2014). A descriptive research design was used to perform this research investigation. The findings of the study showed that 87% of the participants agreed and 13% disagreed in relation to facilitators' lack of skills and specialist knowledge as factors limiting the use of ICT in Polytechnics. Another study was conducted on the cost of hardware and software in the Philippines, Beggs (2010). The study was conducted by Mutula (2016) as the research aimed at addressing ICT adoption and integration and the issue of funding from government and stakeholders. A knowledge gap still exists in the ICT sector as the study attempts to fill the gap in line with Education 5.0, and the researcher conducted a study of success and challenges affecting the teaching of ICTs in Zimbabwean polytechnics.

PROBLEM STATEMENT

Despite the teaching of ICT in schools, initiated by the Government of Zimbabwe, (2010), the use and teaching of ICT in polytechnics is progressing at a tortoise's pace. The current educational curriculum places a greater emphasis on the use of ICT as instructional instruments. However, the integration of technology in polytechnics is hampered by a lack of finance. The educational systems across the world-over are transforming from a textbook approach into a blended learning system supported by electronic media, hence the need for financial support.

RESEARCH OBJECTIVES

a) To assess the success in common computing skills levels among the staff and students.
b) To investigate levels of usage of ICT skills adoption and integration between students and staff.
c) To investigate the challenges in ICT skills adoption and integration between staff and students.

LITERATURE REVIEW

The relevance of ICT in colleges: ICT has become increasingly effective in facilitating learning across the curriculum, according to Riley & Reedy (2020). This means that technological advancement prompted beneficial changes in polytechnic education, enhancing not only the standard but also the quantity of teaching-learning activities. Zimbabwe was able to alter its Education Act of 1987 in 2006 thereby facilitating educational technology uptake and instruction. According to UNESCO (2008), the new Education Act now aspires to promote ICT infrastructure and e-governance as one of its incremental policy objectives. Adult learners are motivated and their cognitive abilities and achievements are enhanced when ICT is used in the classroom (Ilomaki, 2008). This is to help adults prepare for the digital world of the twenty-first century, when critical skills such as communication and teamwork are essential. This is because what "teaching and learning" meant in the nineteenth century, prior to the emergence and implementation of Zimbabwe's ICT strategy in 2007, cannot imply the same thing now (Januszewski & Molenda, 2008). The fact that the internet and the World Wide Web (www) provide a wealth of knowledge on any subject means that facilitators and learners perform better because learning activities are completed faster. ICT teaching and learning is often skill-based and it promotes student-centered learning.

Success in common computing skills level among the staff and students: According to Corbeil (2007), pupils who were exposed to multimedia presentations preferred them over textbook presentations. She believed that when students' attention was captivated through highlighting, colour, varied typefaces, and visual effects, they learned better. A sort of pseudo scale was utilized in this study to depict the variables or elements that reflect computing kills, therefore means that purpose statistics were assumed, Valtari (2006). Operating systems, word processing, spreadsheets, presentation software, and the Internet were used to examine students' experiences and attitudes regarding using ICT in colleges.

Levels of usage of ICT skills adoption and integration between students and staff: The incorporation of new technological structures facilitates the incorporation of new approaches to teaching and evaluating students with ICT, for observing the progress they have made; that is, these competencies develop planning and organizational skills in education, which aids the construction of new knowledge, using technologies as tools in new scenarios (Jiménez and Gijón, 2016). Digital skills, according to Lévano, Sánchez, Guillén, Tello, Herrera and Collantes (2019), are the perspective of the new educational training, with a clear objective of educating and preparing students, allowing them to appropriate themselves of new ICT knowledge, tools that serve to include them within the educational system. The level of digital skills usage of the 21st century drive the competitiveness and innovation capacity of organizations (Lévano et al., 2019). There are different levels of usage of ICT including the frequency in use ICT tools in teaching and learning, computers and Internet for teaching and learning purposes, mandatory to use computers for teaching and learning, Students are conversant with the use of ICT tools, There is a college budget to support ICT skills development. Although these skills are considered crucial, the digital aspect integrated with the skills of the 21st century is still not sufficiently defined (Van-Laar et al., 2018).

Challenges in ICT skills adoption and integration between staff and students:
Lack of funding from government and stakeholders: The lack of policies to regulate the country's ICT growth and use is an obstacle. Computers and similar products are frequently viewed as luxury commodities, according to Minishi-Majanja (2007), and high government taxes are levied, raising the cost of such equipment. Many countries now have severe regulations in place for any organization or individual wishing to contribute instructional materials to schools. In this regard, a factor influencing the teaching of ICT in Zimbabwean technical colleges is a lack of money from the government and a lack of funding from sponsors due to high taxes and other government policies. Mutula (2004) argues that educational institutions should receive government technological subsidies. Schools and colleges would benefit from the availability of government subsidies for purchasing ICT-related goods.

Improper ICT infrastructure: Lack of suitable and functioning computers, according to Ginsberg and McCormack (1998), has a negative impact on computer use and education. The outcomes of the study revealed that a lack of computers, printers, and other ICT infrastructure contributed as a serious obstacle to computer education implementation. Middleton et al. (1997) conducted another study that supported the importance of computer hardware in the implementation of computer education. However, these findings aided the researcher in determining the factors that may influence the use of ICT in Zimbabwean polytechnics for teaching and learning.

Expensive hardware and software costs: Krysa has recognized technical support as another crucial enabling aspect (1998). According to the researcher, computer hardware and software problems arise more frequently than they are resolved. As a result, there are high maintenance expenditures for ICT resources, which are crucial for teaching and learning. Many of these challenges are above the teacher's present degree of computer competence (Krysa, 1998). It is therefore the responsibility of responsible authorities in polytechnic colleges to appoint ICT department technical professionals to look into hardware and software concerns while leaving the instructional process.

Lack of skills and expert knowledge: One of the major impediments to the use of computers in primary education is teachers' lack of knowledge and abilities (Reeves, 2008). ICT personnel were engaged to teach courses in other areas of competence at polytechnics and are expected to teach ICT as well. Teachers with insufficient knowledge and skills to use different technologies in teaching have skewed the use of ICT in this scenario, causing overloading of others. The demand for ICT education is enormous, yet the number of instructors trained to teach it is insufficient to provide it (Pilkington, 2008). There are more pupils who want to learn computer skills than there are teachers who can teach them (Ibid). This shortage is one of the major challenges affecting ICT education in Zimbabwe's polytechnic institutes.

METHODOLOGY

The research adopted interprevist research philosophy which was deemed qualitative. Moreover, this philosophy is associated with finding a narrative for social phenomena in their natural environment. The target population of the study constituted 220 employees of the polytechnics and was reduced to 140 making use of the sample size determination model by Krejice and Morgan. The study used an adopted closed-ended questionnaire with a 5-point Likert scale which ensured the reliability and validity of the results in the study.

RESULTS AND DISCUSSION

I08 questionnaires were returned out of the 140 questionnaires that were distributed giving a response rate of 77%. Males constituted 68% while females were 32%. 56% were holders of National Certificates (NC), 22% were National Diploma (ND) holders, 16% were degree holders, and 6 % were holders of other qualifications.

The common level of computing skills among staff and students
Table 1: Statistics for Common level of computing skills among staff and students

		Operating System (Windows): I can install and update the Windows operating system.	Word processing: I can edit, format, save, open, and print text.	Spreadsheet Software: I can create simple formulas and use them for calculations.	Presentation software: I can create a presentation by using PowerPoint.	Internet Usage: I can search for information on the web.
N	Valid	108	108	108	108	108
	Missing	0	0	0	0	0

Mean	4.56	4.53	4.45	4.46	4.40
Median	5.00	5.00	5.00	5.00	5.00
Mode	5	5	5	5	5

Source: IBM SPSS Statistics v20

Based on the mean, median, and mode results in Table 1, the respondents strongly agreed that they were knowledgeable with Windows (operating system) as a common level of computing skills and that they were competent in Word processing, confirming a higher level of word processing as common computing skill. The respondents also strongly agreed that they are able to create simple formulas and use them for calculations in Spreadsheet Software. The respondents strongly agreed that were able to use the presentation software, which they frequently used during presentation sessions, workshops, seminars, and training courses and lastly, the respondents strongly agreed that they were able to use the internet.

Levels of ICT skills usage in teaching and learning to students and staff.
Table 2: Statistics for Levels of ICT skills usage in teaching and learning to students and staff

		I frequently use ICT tools in teaching and learning	I frequently use computers for teaching and learning purposes	It is mandatory to use computers for teaching and learning	Students are conversant with the use of ICT tools	There is a college budget to support ICT skills development.
N	Valid	108	108	108	108	108
	Missing	0	0	0	0	0
Mean		4.31	4.32	4.21	4.25	4.22
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4

Source: IBM SPSS Statistics v20

Table 2 indicates that the respondents agreed that they can frequently use ICT tools in teaching and learning, frequently use computers and the internet for teaching and learning purposes, and that it was mandatory for them to use computers for teaching and learning in Polytechnics. The respondents also agreed that students at their colleges are conversant with using ICT tools and that the college has a budget to support ICT skills development.

Challenges in ICT skills adoption and integration between staff and students.
Table 3: Statistics for factors affecting the use of ICTs in Polytechnics

		High cost of hardware and software	Lack of funding coming from the government and stakeholders	Improper ICT infrastructure	Facilitator's lack of skills and specialist knowledge
N	Valid	108	108	108	108
	Missing	0	0	0	0

Mean	4.18	4.22	4.13	4.06
Median	4.00	4.00	4.00	4.00
Mode	4	4	4	4

Source: IBM SPSS Statistics v20

As depicted in Table 3, the respondents agreed that the high cost of hardware and software, lack of funding from government and stakeholders, improper ICT infrastructure and facilitators' lack of skills and specialist knowledge were the challenges in ICT skills adoption and integration between staff and students.

RECOMMENDATIONS

The study recommends that the institutions should upgrade their ICT infrastructure and resources in order to maintain the success in computing skills level of staff and students in teaching and learning. They should also promote organisational learning.

Institutions should come up with short courses with computer applications so that the level of ICT skills usage by staff and students in teaching and learning is enhanced. They should also promote organisational learning.

The study recommends that the Polytechnics should be innovative, identify critical needs in the community, and come up with potential projects so that they get money instead of relying on funding from the government and stakeholders.

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