RESEARCH ARTICLE

INTEGRATING INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION IN RELATION TO SCHOOL TECHNOLOGY CULTURE

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ABSTRACT

Information and Communication Technology (ICT) integration in education is the use of technology tools in teaching and learning general content subjects. This paper explores how a school's technology culture; a way of doing things with respect to technology influences ICT integration in education. It draws insights from the results of a study carried out in Harare secondary schools on 'Information and communication Technology Integration by Harare Secondary Schools Teachers, in relation to School Culture and their Educational leader Competencies'. Data were collected using close ended questionnaires. Participatory research was also carried out to the current position of schools with respect to this reform. The results showed that the mean school technology culture of the schools in Harare lied between weak and moderate. They also showed a strong positive relationship between school technology culture and ICT Integration in Harare secondary schools.

Keywords: ICT) integration, education, School Technology Culture

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INTRODUCTION

Information and Communication Technology (ICT), integration in education originated from a constructivist philosophy of education, where learners are actively involved in constructing their own knowledge. It is a pedagogy which is currently being advocated for worldwide, because of the benefits it brings to education. In Zimbabwe, ICT integration in education has been influenced by a number of preceding general and sectorial policies. These include: 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, (Isaacs, 2007).

This paper explores the relationship between school technology culture; the way of doing things in a school with respect to technology, and integration of ICT in education. It advocates that for effective ICT integration in education, we need to build a strong school technology culture. Establishing a strong school technology culture involves acquiring ICT infrastructure, training teachers and students in the use of ICT, widespread use of ICT in teaching and learning and using ICT in other aspects of a school's functions such as communication within the school and with the outside world. It draws insights from a study on 'Information and communication Technology Integration by Harare Secondary Schools Teachers, in relation to School Technology Culture and their Educational leader Competencies'.

Research Objectives

- To find out the relationship between ICT integration in education among secondary school teachers and school technology culture.
- To study the differences in the level of ICT integration among secondary school teachers.
- To analyze the differences in the level of school technology in secondary schools.
- To identify the differences in ICT integration in education across demographics, with respect to age, gender, marital status, teaching experience, subject taught and school type.
- To study the differences in school technology culture, across demographics, with respect to age, gender, marital status, teaching experience, subject taught and school type.

Literature Review

Pinchot et al (2010: 1) [2] carried out a study on "How Mobile Technology is Changing Our Culture". The study sought to determine how mobile technology has changed our culture and it identified the ways in which we now perceive socially acceptable communication. It looks at how cell phones have changed cultures by giving employers access to workers even when they are on holiday. Emails can now be accessed from home and if they refer to urgent work matters, they can be auctioned immediately. A school's technology culture can therefore allow students to access work from school from the convenience of their homes. Teachers can also make use of cell phones to give homework.

Bakhshi, 2010) [3] carried out a study on "Digital Culture: How arts and cultural organisations in England use technology". 79% of their respondents felt that the internet and digital technologies have played a huge role in broadening art and culture. The study also stated that digital technologies help organisations to fulfill their mission.

Shamir-Inbal et al (2009) [4] carried out a study on 'Assimilating online technologies into school Culture. The aim of the research was to design and evaluate a model for teachers to use for assimilation of online technologies into their school culture using a socio-constructivist approach. Their findings showed that teachers could play a key role as partners in designing educational technologies and also as autonomous designers and developers of their own online activities. Their model enabled teachers to successfully take this role. Qualitative and holistic change was noted in the school culture as most teachers designed online activities and updated class websites in line with the school vision and thoughtful planning of novel educational activities.

Mesch, 2009 [5] explains the profound influence technology has on culture in the article, "The Internet and Youth Culture". Two views are presented; the technological deterministic view: which sees the

internet as an innovative force that has profound influence on the youth and children and the internet as a cultural artifact. As a cultural artifact, the internet is viewed as an object immersed in a social context, incorporated in everyday life and used in communication, expression, and content production.

Meier, 2007 [6] carried out the project "Enhancing intercultural understanding using e-learning strategies". The aim of the project was to develop e-learning contents and educational applications in order to enhance intercultural understanding and awareness among learners in South Africa and Finland. This study explored the possibility of ICT actually influencing culture.

Urevbu,1997[7] did a study on "Culture and Technology". Culture was viewed as the totality of the technological, sociological and ideological features of a given society. Technology is said to be a cultural enterprise which exists in different extents in all societies. Technology certainly produces a well-defined world view and well defined attitudes which is manifest in each society.

RESEARCH METHODOLOGY

A quantitative survey was carried out in secondary schools during the period 2012-2013. It was carried out in Harare province in Zimbabwe. Qualitative methods of data collection such as observation and participatory research were only used during the feasibility study and in piloting and refining the questionnaire.

The ICT Integration questionnaire (ICTIQ) and the School Technology Culture Questionnaire (STCQ) were used to collect data. The (ICTIQ) consisted of closed ended items distributed under the subsections: School ICT Capacity, Applications of ICT in the Classroom, Assessing Student Outcomes using ICT, and Personal / Professional Use of ICT. It was adopted from an instrument used to research evaluate ICT knowledge and skill levels of Western Australian government school teachers. (Western Australia Department of Education, (2006) [8]. The School Technology Culture Questionnaire (STCQ) assessed how the school used ICT in aspects of its running such as teaching and learning, communication, enrolment, and report writing.

The sample comprised 248 teachers from secondary schools in Harare district of Zimbabwe. This was based on the accessible population of 2480 teachers. The results were analysed using the Statistical Package for Social Scientists (SPSS) version 20 (Bryman, A. and Cramer, D. (2001) [9].

Pearson's Product Moment Correlation Coefficient (r)and Spearman's correlation Coefficient were used to measure the degree of relationship between the dependent variable (extent of ICT integration) and each of the independent variables (school culture, educational leadership competency and demographics). They were also used to find the degree of relationship between the two main independent variables (school culture and educational leadership).Independent T-test was used to test for differences between two groups. One way ANOVA was used to test for differences where more than two groups were involved. Cohen and Manion (2011) [10].

RESULTS AND DISCUSSION

Table 1: School Technology Culture Statistics

N	248
Mean	2.54
Std. Error of Mean	.032
Std. Deviation	.498
Variance	.248
Skewness	.025
Range	3
Minimum	1
Maximum	4

The scale for School technology culture ranged from 1=strongly disagree, 2=disagree, 3=agree up to 4=strongly agree. The mean school technology culture obtained was 2.54 with a standard deviation of 0.498. The mean is midway between disagree and agree. It reflects a school technology culture which lies between weak and moderate. This is indicative of the fact that schools in Harare have begun to incorporate technology in their way of doing things.

Figure 1.   ICT Integration scores
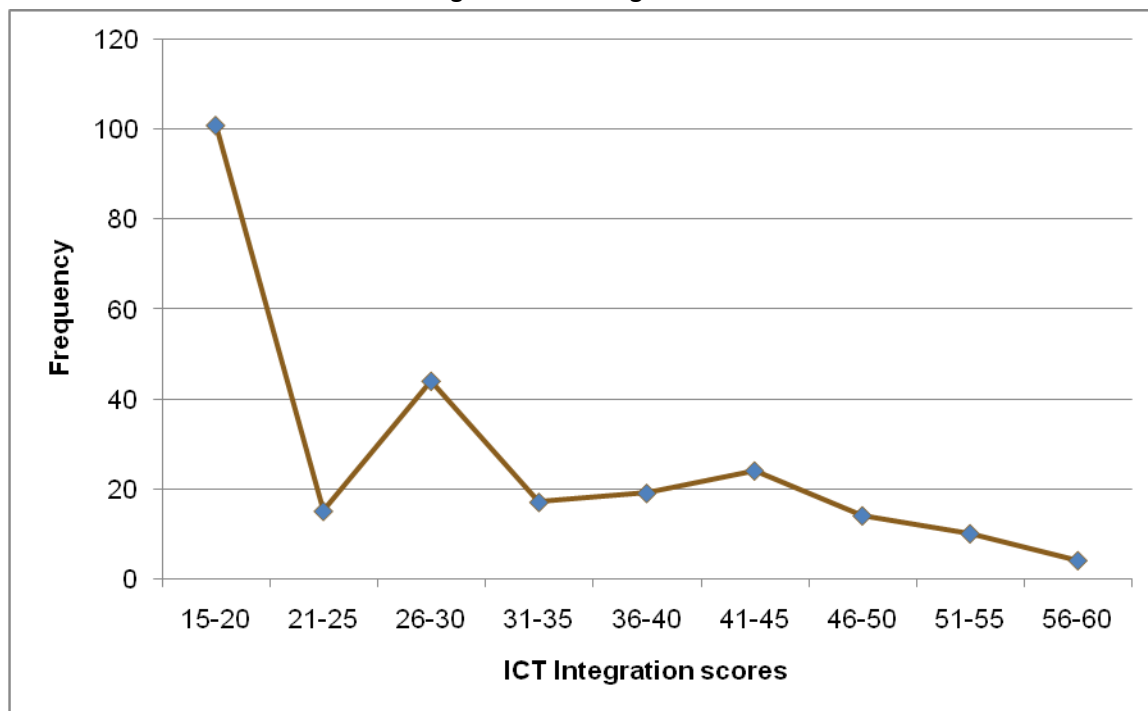
The scores of 15 to 20 were characteristic of responses which showed ICT was used in education once a term or never as opposed to the scores 46 to 60 which were from weekly and daily use of ICT in education. The graph above shows that the majority of the respondents had integrated ICT into their teaching to a low extent.

Based on a Pearson's correlation there is a significant positive relationship between ICT integration among teachers in Harare secondary school and the school technology culture. (r=0.524, at p<0.0005). There is a significant difference in school technology culture, with respect to school type, (2-tailed p value from the independent T test is value is 0.0005, which is < 0.05). There is also a significant difference in school technology culture with respect to subject taught, [F ratio (627.475/198.470=3.162), at p<0.003].

There are no significant difference in school technology culture, with respect to marital status, age, teaching experience and academic qualifications.

The variables which were found to be most significantly related to ICT integration among secondary school teachers in Harare were: school technology culture [F=9.575 at p<0.0005], subjects taught [F=4.945 at p<0.0005 and age [F=-2.565 at p<0.011].

RECOMMENDATIONS

Secondary schools need to build a strong school technology culture in order to enhance ICT integration. This can be achieved through establishing the relevant ICT infrastructure such as computers for teachers and students to use in the classroom, projectors, internet facilities and educational software. Technical support is also necessary and teachers need to undergo professional development courses which equip them with ICT skills and an understanding of how ICT is effectively integrated. A strong school Technology culture also involves the use of ICT in other aspects of school life such as communication with parents, communication among staff members and marketing the school.

Certain age groups need to be motivated to use ICT in their teaching and learning activities. There might be need to assess which teachers were trained during an era when ICT skills were not part of the teacher training curriculum, and introduce in service training on the use of ICT in education to these teachers. Teacher training colleges and university education departments need to include ICT integration in education as part of their curriculum.

Schools need to introduce ICT related subjects into their curriculum to foster ICT integration. Subjects such as Computer Studies, Applied ICT and Computing use ICT everyday and they enable students and teachers to develop the skills necessary for ICT integration in education. The existence of an ICT department also helps to provide technical support to teachers in other departments. The teachers of ICT related subjects can assist in training other staff members to become technologically literate. The ICT department can also help in advising school administrators on the most economic infrastructure to buy and the best service providers to engage.

Government schools had a lower school technology culture than that of private schools which implies that government schools can learn from private schools how to modify their school culture so that they use technology more in their way of doing things. The school heads from government schools can visit private schools and learn from them how to effectively build a school technology culture.

CONCLUSION

School technology culture is significantly related to ICT integration in education. Schools need to build a strong school technology culture in order to enhance ICT integration in education.

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