Training Needs Assessment and Utilization of Information and Communication Technology in Secondary Teacher Education Colleges in Zimbabwe

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ABSTRACT

This study aimed at assessing training needs that would enable not only lead to successful integration of ICT skills into teacher education curriculum in Zimbabwe, but also to sustained use of ICT resources. The research sought to analyze the gap between the ideal and the situation on the ground. A combination of both qualitative and quantitative approaches was utilized to get the best out of each of the designs. Thus the research employed the use of questionnaires from which quantifiable data was generated, whilst valuable opinions, experiences, insights and feelings were captured through interviews. Policy documents and syllabuses were analysed to understand the context in which colleges implemented their ICT decisions, and this also enabled the researchers to triangulate by counter checking sources checked against each other to ensure reliability. Findings revealed that whilst lecturers are indeed using ICT skills and resources in their teaching, they are incapacitated by inadequate training. Most lecturers received ICT training on joining the colleges and none thereafter; hence there is a lack of Continuous Professional Development. (CPD) The research also identifies among other things barriers that are working against full ICT integration into the teacher education curriculum and these include access to ICT resources, technical problems associated with ICT use such as poor internet connectivity and lack of training programmes. Several recommendations are made, among other things that there is need for a well thought out training programme that would ensure success and sustainability of ICT integration into college curricula. Training should be part of CPD and should be central to the success of ICT integration. Other recommendations advanced include the need for standards that guide the implementation of ICT syllabi to ensure a good product in the form of a teacher graduate, that college administrators need to invest more human and financial resources on ICT integration, and lastly that the teaching of ICT skills needs to be decentralised from the IT Units in colleges to subject areas so that subject specific ICT skills are developed and subject lecturers are forced to develop their own ICT skills

Keywords: Information and Communication Technology, Teacher Education, Continuous Professional Development, ICT Integration, Curriculum, Zimbabwe

INTRODUCTION

Most of Zimbabwe's teachers are trained through the country's 15 teacher education colleges, with twelve being state owned. All teachers' colleges in Zimbabwe are associate colleges of the University of Zimbabwe through affiliation to the Department of Teacher Education (DTE), which acts as the certifying authority. Of the 15 colleges, 12 are Primary Teacher Education Colleges and 3 are Secondary. Another sizable number is trained through the various Universities that offer the Post Graduate Diploma in Education (PGDE) or other degrees with an education component. The University of Zimbabwe's Department of Teacher Education runs a scheme of association with all the 15 teacher training colleges, besides training its own teachers within the Faculty of Education. The scheme of association allows it not only to certify but to monitor and maintain high standards of tuition. However, each

college designs its own curricula including the one on Information and Communication Technology (ICT), for approval by DTE.

Like many other educational systems the world over, Zimbabwe is now under increasing pressure to use and impart ICT skills to students that are relevant for the digital age. For teacher education the benefits of using ICTs in learning can only be achieved if both pre-service and in-service teachers are equipped with relevant pedagogies and skills during training. 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 following a host of preceding general and sector policies that included the Nziramasanga Education Commission Report of 1999, the National Science and Technology policy of year 2002, and Vision 2020. In particular the Nziramasanga Commission recommended the use of computers for teaching and learning in educational institutions. Hence the National ICT policy makes significant reference to the promotion of ICTs in education including their pedagogical use in educational institutions. In response to the identified policies, DTE made a policy decision in 2005 not to certify students from the fifteen teacher education colleges who have not done a course in Information Technology (IT) or ICT in Education. To kick start the process, DTE advised each of the three secondary teacher education colleges to come up with an IT syllabus detailing concepts, skills and methodologies to be inculcated in student teachers and have it approved. This effectively resulted in differential emphasis on the types of skills to be developed since each college came up with its own ICT programme. Yet, once qualified, the teachers from the three secondary teachers colleges find themselves teaching together in the same schools and using the same ICT equipment. This created a mismatch on how they teach and what they teach in schools.

The integration of ICTs in Zimbabwe's secondary teacher education colleges was achieved through a Belgian funded programme called College Information Technology Enhancement Programme (CITEP)[i]. The Flemish Association for Development Cooperation and Technical Assistance (VVOB)[i], a non-governmental organisation from Belgium, identified a gap in the use of ICTs in teaching and learning at teacher education colleges. The CITEP programme which ran from 2003-2008 was carried out in three secondary teacher training colleges and ten polytechnic colleges. The programme was done in three phases namely, the development of ICT infrastructure, ICT technical support and finally staff development. Thus the CITEP programme ensured that secondary teacher education colleges become compliant with the new DTE regulation that required acquisition and use of ICT skills by student teachers mandatory.

However, reflections made by Musarurwa (2011), of the CITEP programme revealed that most college lecturers were not competent to take their classes using ICT equipment and cascading ICT skills to teacher trainees. In other words, they lacked skills to use ICT for both pedagogical and educational management purposes. Thus the whole programme of teaching ICT skills eventually fell on the College IT departments who are tasked with developing ICT infrastructure, maintaining it and teaching IT skills to students. The same author also revealed that imparting ICT skills could have been better handled at subject level, since each subject requires specialised IT skills and software. Thus there was a need to integrate ICT skills to the various subject areas if students were to benefit and this would involve both college lecturers and students, thereby forming the basis of this follow up research whose aim was to identify gaps in ICT skills and assess training needs in the use of ICT.

THE STUDY IN CONTEXT

This study was carried out in the three secondary teacher education colleges in Zimbabwe and the target population included lecturers and college IT unit members. Its scope centred on a skills audit of college lecturers against ideal skills needed, hence it can be seen as a needs assessment[i] of skills that are needed for using ICTs in education. The focus was on ICTs and their utility value in teaching and learning different subject areas in all the three teacher education colleges.

DTE as the certifying authority, prescribed that all secondary teacher trainees should acquire relevant ICT skills in order to be awarded with a Diploma in Education. However, DTE did not prescribe the minimum standards or specify skills that should have been attained. This means the three secondary teacher education colleges in Zimbabwe have different ICT syllabuses producing teachers with varying ICT skills for use in the same schools. Thus there are no clear ICT skills identified for an ideal secondary school teacher and how these skills can be taught effectively. Developing a curriculum that sets the benchmarks of ICTs in education is further hampered by the lack of personnel who have expertise in both Information & Communication Technology and Education, hence the problem of identifying standardized ICT skills that would make teacher educators more functional in their teaching careers.

OBJECTIVES AND ASSUMPTIONS OF THE STUDY

The objectives of the study were to:

i.   Assess how ICTs were being used in the teaching and learning process in secondary teacher education colleges.
ii. Establish ICT skills and competencies which college lecturers in secondary teacher education colleges currently have.
iii. Assess the skills and competencies that teacher educators require for the use of ICTs in secondary teacher training colleges.
iv. Establish the extent to which ICT skills developed in teacher trainees are relevant to the subject specific skills needed in secondary schools.
v.   Come up with a framework for the training and use of ICT in secondary teacher training colleges.

ASSUMPTIONS OF THE STUDY

Certain assumptions were embedded in this study as an attempt was made to answer the specific research questions. It was assumed that the initial CITEP program had the same impact in all the three colleges, and that college administrators understood and supported the infusion and use of ICTs in teacher education. Another important assumption was that ICT policies in colleges, syllabuses and DTE requirements for ICT skills development were aligned to the national ICT policy. Lastly, another important assumption was that all three secondary teachers colleges, despite trying to preserve the uniqueness offered by their different disciplines, were prepared to adopt a certain level of standardization in ICT skills that would assure functionality of graduates. However the teaching and learning environment at the three colleges are different and thus presented different platforms from which the skills audits were done. One of the colleges has a technical orientation with quite a number of disciplines where ICTs are readily applicable while two others are more academic oriented.

Use of ICTs in Teacher Education Colleges in Zimbabwe

Zimbabwe's late entry into digital age is a blessing in disguise since it has a lot to learn from scholars, researchers and countries that have moved along that route before. Unwin (2005)

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argues that among other things, there should be a shift from an emphasis on 'education for ICT' to 'ICT for education'. Tubin (2006) explains that the ICT "lever" takes many forms… and as such ICT`s roles in the curriculum should be viewed as learning about ICT, learning with ICT, and learning through ICT. Loveless (2007) reveals that in the English National Curriculum in the UK, ICT is presented as a subject with particular knowledge, skills and concepts, and as a tool to support learning in other curriculum subjects. All these aspects are lacking in Zimbabwe's teacher education curriculum. The researchers' experience with teacher education colleges reveals that very few lecturers are prepared to integrate ICT technologies into their own subjects. Many of them are of the view that ICT should be a separate subject taught by IT personnel. For them such integration is time wasting and of no importance. Of course there are several reasons for such a scenario as pointed out by Coutts, Drinkwater, and Simpson (2001). They argue that teachers in schools see ICT use as an additional subject or complementary teaching activity because they lack the knowledge or skills that would allow them to integrate ICT into classroom learning, or begin to think about how ICT could be used to transform learning and teaching. This could be true of Zimbabwe since there is lack of an integration model or framework.

The reasons that prevent educationists from using technology are many. Mumtaz (2000) quotes a number of researchers (Rosen & Weil, 1995; Winnans& Brown, 1992; Dupagne & Krendl, 1992; Hadley &Sheingold, 1993) who have come up with a list of inhibitors. Among others, the reasons advanced include lack of teaching experience with ICT; lack of on-site support for teachers using technology; lack of help supervising children when using computers; lack of ICT specialist teachers to teach students computer skills; lack of computer availability; and lack of time required to successfully integrate technology into the curriculum. Whilst these observations were made in relation to teachers in schools, they are applicable to lecturers in Zimbabwe's teacher education colleges. McNair and Galanouli (2002)'s view that lack of or the absence of an agreed model for teaching through ICT, means that the potential for transfer of ineffective application of ICT as a pedagogical tool in teaching subjects is enormous. "Such situations are likely to result in the students themselves lacking the competence to use ICT in teaching in their placement schools." (Galanouli& McNair, 2000:192). At present there are no guidelines detailing how concepts, skills and methodology are to be used for teaching the students. ICT integration is being done in an uncoordinated way such that both the student teachers and the system will not benefit. Therefore, developing a model relevant to Zimbabwe's conditions is necessary, despite that the nature of ICT itself is constantly changing as observed by Simpson et al 1999 in Galanouli& McNair (2000) who point out that models of ICT-based pedagogy may themselves prove to be short-lived, leaving tutors with the problem of having to constantly update their skills.

RESEARCH DESIGN AND METHODOLOGY

The research design that was used in this study was the case study, which is an empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident; but allowing multiple sources of evidence to be used (Leedy 2005). Although case studies are qualitative research approaches focusing on a phenomenon, they allow a combination of both qualitative and quantitative techniques to be utilized. The approach allows for the study of multiple cases in this instance, up to three secondary teacher education colleges. As noted by Yin (2003) the case study design was appropriate in this study since it helped to answer "how" and "why" questions in a situation where researchers could not manipulate the behaviour of the

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participants in the study. The target population comprised of all secondary teacher educators and IT personnel in the three secondary teacher education colleges in Zimbabwe.

Purposive and quota sampling (cluster sampling) were found to be the most appropriate for this study. Purposive sampling was used for IT unit personnel in all the three colleges while the cluster sampling technique was used for teacher educators. As there are four different departments in the secondary teacher education colleges, it therefore became apparent to use this method. In essence, each department supports different subject areas (clusters); for example Education department supports Health and Life skills, National and Strategic studies, Teaching Practice, Professional studies and ICT. In that note, each department formed a cluster as these were mutually exclusive with each other; the individuals within each department belonged to different subject areas (units).

Data was collected through document analysis, questionnaires and interviews. Documents such as the national IT policy, colleges and schools ICT syllabuses and the University of Zimbabwe scheme of association documents were analysed. The use of these various methods ensured triangulation in data gathering and analysis thereby helping to deal with the demands of validity and reliability. McMillan and Schumacher (1997) support this idea by pointing out that in order to find regularities in the data; the researcher should compare different sources, situations and methods to see whether the same pattern keeps recurring. The data collected through questionnaires was analysed using the Statistical Package for Social Sciences (SPSS) software since this software offered effective data management, wide range of options and better output organization. Qualitative data from both interviews and questionnaires was subjected to interpretive, structural and reflective analysis. This helped come up with recurring concepts, themes and patterns on the integration of ICTs as well as helping researchers to make judgments and suggestions based on intuition.

FINDINGS AND RECOMMENDATIONS

Use of Information and Communication Technology

Since one of the objectives of the study was to establish how far hardware and software components were used in teaching and learning, results show that the majority of lecturers are more comfortable in using computers for word processing (77%) than for presenting a lesson (19%). This is consistent with findings from interviews which, reveal that there is no enough hardware such as digital projectors and laptops for use in lesson delivery. Most lecturers pointed out that they end up using personal laptops for college business and where such equipment is available in colleges, it is mostly used for mass lectures while smaller classes are condemned to chalk and talk. Another recurrent finding pertains to access of digital projectors which is often limited since one has to sign for it or may only be available on particular periods of the day. Ignorance on how to make use of some software, fear of change and prevalence of antiquated equipment that is not user friendly were also cited as other problems. IT managers noted that younger lecturers were confident in using ICTs in their teaching. These findings are consistent with those made by Goodwyn et al (1997) who found out that "fearful" teachers are a category made up of experienced older teachers to whom ICT is generally a threat and cause of anxiety. However this contradicts the findings from questionnaires where 74% of the respondents (most of them over 41 years) said they are confident in using ICTs in their teaching. Thus this is probably an area that needs further research.

Another interesting scenario that came to light as shown in fig 1 was on the dominance on the use of internet, email, and search engines. One would infer that these programmes were used for research, preparing for lesson as well as communicating with students.
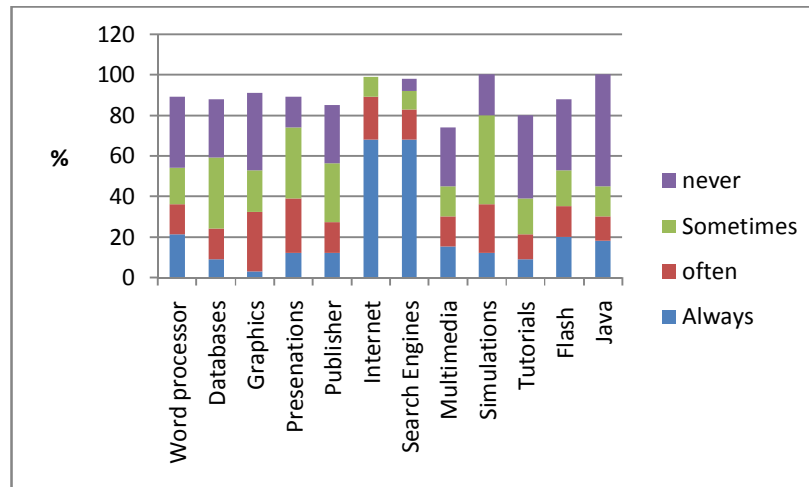
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Fig 1:Use of ICT programmes by lecturers

Conversely, other components are hardly utilised by lecturers. These include simulation programmes, interactive tutorials, databases, desktop publishing and presentations. Follow up interviews with IT unit personnel revealed that they have never scheduled training of lecturers in the above programmes. Some of the programmes need a review of college policies such that use of databases could be made possible to enable inter and intra department access of information. In short most lecturers lack the requisite knowledge in the identified areas.

ICT Skills and Competencies

79% of respondents did indicate receiving some form of ICT training. Of those who received such training, 41% received during pre-service training while 23.5% as in service. The remainder got it elsewhere. IT managers revealed that basic in-service ICT skills training in word processing, spreadsheets, internet use, and network resources for new lecturers were done in all the three colleges. Although 82% of respondents indicated receiving basic ICT skills in office applications, resource tools and communication tools, it appears as if the training is not sustainable since respondents pointed out to a lack of Continuous Professional Development (CPD) in ICT. This is due to the fact that training is offered to new lecturers only when they join the college but there is no follow up or skills upgrading of those already in the system. This may be the reason why despite receiving training on Learning Management Systems (LMS) such as MOODLE, such platforms are not fully functional in all the three colleges. Thus the need for CPD confirms the finding by Claeys et al (1997) that adequate training is not only an absolute priority but that it also demands major investments both in time and money. Thus college administrators should ensure continuous professional development for lecturers by availing funding and time. However most respondents seem ignorant of subject specific competencies and software hence most were unable to itemise skills and competencies related to subject content, pedagogy and related technical and social issues. It is evident that many teacher educators fail to appreciate that the role of the lecturer is evolving or transforming from being the source of information to that of a facilitator and thus CPD should also reflect such changes and redefine the tasks, status and role of teachers. A lecturer should be an organizer, architect, coach, counsellor, director, resource manager, mentor, shepherd, moderator and facilitator. The demands of such competencies are increasing and working with technology implies incremental tasks to fulfil the face-to-face teaching (Claeys et al 1997).

ICT Integration into Secondary Teacher Education Colleges

Whilst answering the research question "how best can the development and use of ICTs be implemented in secondary teacher education colleges?" most respondents felt that basic ICT skills should not only be integrated into the teacher education curriculum, but that there is need to include subject specific ICT programmes that will help groom better subject teachers. Good examples of such programmes include Pastel for Accounting, GIS for Geography, Adobe photo shop for Art, crocodile physics and chemistry etc. This calls for devolution of ICT management from a centralised ICT Unit to departmental level, where ICT integration becomes relevant.

Another recurrent issue was that ICT should be timetabled within subject areas so that it can be taught for the entire duration of the diploma programme. This would in turn force subject lecturers to acquire and make use of ICT skills in teaching. Thus the general feelings, opinions and insights point out to an unsuccessful and inadequate integration of ICTs into the present teacher training curriculum.

Majority of respondents (82%) also argued that standards guiding the implementation of ICTs in teacher education are needed. Reasons cited included the need for uniformity in the quality of teacher education such that all teachers produced from any of the three secondary teacher education colleges have the ICT skills that would make them functionally uniform in the field. The other reason given that a standardised approach would solve the problem of resource and personnel shortage within colleges by make it possible to share where possible and when need arises. Eventually, uniform standards would ensure proper implementation of the programme through full compliance with laid down procedures.
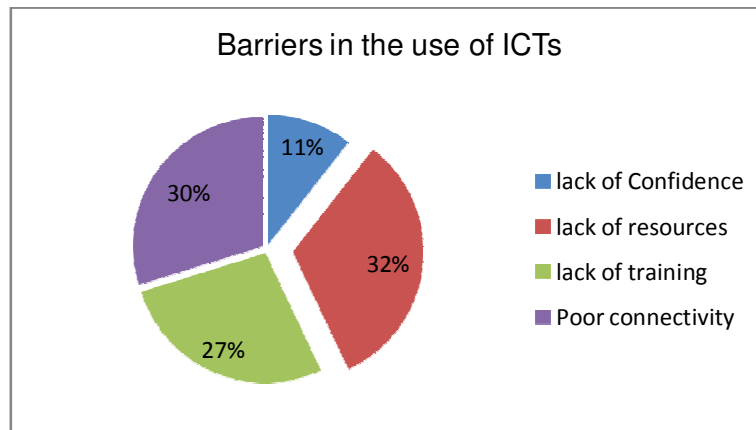

Fig 2. Factors identified as barriers to the full integration and use of ICT resources

Interestingly, several factors were identified as barriers to the full integration and use of ICT resources by college lecturers. (See Fig 2) Firstly, it was established that at one of the colleges, resources were not only inadequate, but there was also a problem of access to the little available resources, yet in the other two colleges there were inadequate but accessible resources. This is where standard ICT policies would help. The other barriers identified included poor internet connectivity and lack of training that has already been discussed. It was poor internet connectivity made it impossible for lecturers to research, use online databases, chat forums and emails to communicate with students.

The respondents however, identified the five top most important conditions needed for ICT implementation in secondary teacher education as shared vision, access to resources, need for skilled educators, functional and timely technical assistance and availability of ICT resources.

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Most respondents (62%) agreed that skilled educators were by far the most important condition since all other factor depend on the need for skilled personnel, hence the need to train teacher educators and also have a meaningful CPD.

Lastly, analysis of the various college subject syllabuses including the current ICT syllabuses reveals a mismatch between ICT and other subjects. Indeed ICT is a service subject that develops relevant research, organisational, communication and presentation skills to all students. However, the ICT syllabus has general topics that are not linked to any teaching subjects. The ICT syllabus is a stand alone hence has no evidence of a purposeful link with other subject syllabi. DTE policy falls short in prescribing integration of ICT into teaching subjects.

From the research, several recommendations can be made to improve the quality of teacher graduates through the integration of ICT into teacher education curriculum:

i. There is need to decentralise the functions of the current IT Units to subject areas with the aim of making ICTs more relevant in the education of teachers. However various subject areas need to be helped to identify the relevant software and hardware that are useful in such subject areas.

ii. There is need for a policy that guides the implementation of ICTs in colleges. The development of such a policy can be delegated to the certifying authority such as the DTE so as to ensure full compliance in all the colleges

iii. Colleges need to adopt a standardisation policy that would help them share resources, ideas, problem shooting in some instances, ensure the production of a standard graduate and also make it possible for lecturers to remain functional should they transfer to and from any of the colleges.

iv. Since both hardware and software are continuously changing, college administrators need to be empowered to invest adequate financial and human resources in ICT use and integration in the teaching curricula.

v. Since there is growing use of internet by all stakeholders in secondary teacher education colleges, there in need to investigate and adopt effective ways of using the internet to improve lecturers' pedagogies and student performance.

CONCLUSION

This study sought to close the gap between the ideal ICT skills requirements at teacher education colleges and the situation on the ground. The research was guided by Wang's (2008) generic model on ICT integration in which pedagogy; social interaction and technology are seen as critical components of a technology-enhanced learning environment. The research captured valuable opinions, experiences, insights and feelings of those participants involved in teacher education. The research revealed that whilst lecturers are indeed using various ICTs in their teaching, they are incapacitated by inadequate training and a lack of Continuous Professional Development. (CPD) The research also identified among other things barriers that are working against full ICT integration into the teacher education curriculum and these include access to ICT resources, technical problems associated with ICT use such as poor internet connectivity and lack of training programmes. However although several recommendations were given, their successful implementation will depend on depend on the commitment of all stakeholders involved with teacher education as well as with the ability of educators to be able to adapt to the ever changing ICT environment.

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