

Integration of Computers in Teaching of Textiles and Clothing at Tertiary Institutions; A Case Study of Masvingo Teachers' College, Zimbabwe

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Abstract

This article is based on the study that was conducted among tertiary teachers' colleges in Masvingo province in Zimbabwe to examine the challenges of integrating computer as an instructional teaching strategy. The study employed qualitative research methodology with in-depth interviews and observations providing the data elicited from respondents. The key findings of the study showed that lecturers and students held views that computers were not supposed to change everything in the education system but used as part of the existing teaching strategies. It also emerged that lecturers could hardly use most of the computer software such as spreadsheets, PowerPoint, databases and even internet. There was a great shortage of good quality and appropriate computer software at all the colleges for use in practical departments like Textiles and Clothing. It was concluded that lecturers who were supposed to integrate computers were never exposed to a variety of possibilities on the use of computers in teaching. The Ministry of Higher and Tertiary education is recommended to educate lecturers through in-service courses that feature high quality training on the use of computers as an instructional strategy if the goal of computerising the education system is to be achieved. If the challenges of integrating computers revealed and recommendations raised in this research could be implemented by all sectors of the education system, this could positively benefit lecturers, administrators and students to accomplish long standing educational goals such as improving basic literacy and student inquiry.

Keywords: computer, information and communication technology (Ict), computer aided design, spreadsheets, powerpoint

INTRODUCTION

The development of technology started with the formulation of the number system and calculation rules from about 2000 B.C ago, (Graf 1995). These were firstly used in Babylon (now Iraq) and Egypt by public administrators, traders and in astronomy. According to Hirsch built (1980) the first step towards the emergence of digital computers was then taken by Pascal in 1942 when he developed mechanised calculating machines with the dyadic system. The idea of such machines led to the development of the textile loom by Jacquard in 1801 and the concept of punched cards came into being. The Jacquard method was used to run analytical machines in 1822. These characteristics were the forerunners of computer outputs and storage. All these ideas were recreated in Germany in 1938 and such computers were used to perform activities such as playing an instrument, writing with a pen following a mechanically stored program and later solving general logical problems.

The idea of universal computers in education became more concrete in the twentieth century. Access to computers at school is becoming increasingly widespread in industrialised countries starting at primary to higher education. The Oxfam Education Report (2000) asserts that for the United States of

America the ratio of computers to children at primary and secondary schools is at one as to six. In Britain and Denmark it was noted that one third of fourteen years old science students report using computers, (Watkins 2000). This shows that in developed countries computers have become an integral part of life. The UNESCO education for all report (1998) reveals that students with access to computers and information technology have obvious advantages. Such students with basic computer literacy adapt more easily to the profound changes that are happening in the labour markets. The report also states that in America, computers have become part of life in work, education and leisure. In industry and business computers are changing the face of production both on the assembly line and in office. The Oxfam Education Report (2000) however notes that most schools in Sub-Saharan Africa and Southern Africa do not have electricity and telephone lines needed to use computers and access international websites. It was observed that in countries such as Mali and Mozambique where there are fewer than four telephone lines for every one thousand people, the prospects for effective use of computers in education are limited. Studies carried in Kenya by the World Bank (2000) reveals, however, that the African Virtual University based in Nairobi is aiming to increase and improve the quality and

relevance of instruction throughout the region. The University had installed twenty seven satellite receiver terminals and had developed a digital computer library to compensate for the chronic shortage of scientific journals. This is aimed at providing access to resources and facilitates teacher support and curriculum development.

Futurists such as Sakamoto (1995) see the computer revolution our society is currently experiencing as a tremor presaging a worldwide upheaval that could transform our entire civilisation. Thus Sakamoto envisages a change in lifestyle, family structure, work habits and breakthroughs. This optimistic view sees the current interest and activity in education computing as leading eventually to the development of a new generation of computer system especially designed for use in schools and colleges. Equipped with these new systems educators would then be able to develop even more effective ways of using computers to accomplish long standing educational goals and objectives such as improving basic literacy and promoting student inquiry.

It is with this global and regional influence that over the last decade, Zimbabwe has invested heavily in trying to improve and enhance the quality of computer education. The World Bank (2000) observes that Zimbabwe is not managing to produce competitive finished products for the world market in industrial fields like the textile industry due to lack of proper technology that is being imparted to pupils

CONCEPTUAL FRAMEWORK

The model which was used in this study was adapted from Siddiqui (2004)

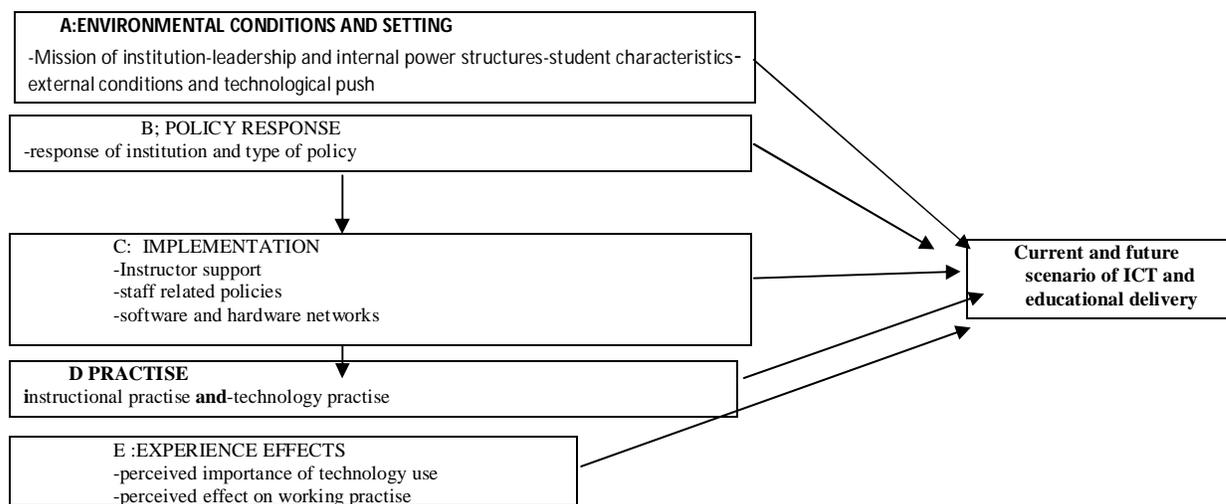


Figure 1; Clusters of variables predicting current and future scenarios of ICT

The conceptual model consisted of variables that will have an impact on an institution’s ICT and delivery approach. There are many variables involved in an institution’s decision to offer its educational program in a certain way to its students. These variables form

whilst at school. This really poses a challenge to schools, colleges and educators as a whole. Rapid developments in information and communication technology present universities and colleges with limitless opportunities and challenges to consider the role of the computer in the education system.

STATEMENT OF THE PROBLEM

Teachers’ Colleges as institutions of higher learning have made strides in acquiring computers for research purposes and for instructional practises by lecturers and students. These computers are however not being used effectively. For the past few years the researchers examined the departments of Home Economics at teachers’ colleges, lecturers did not use these computers. Students’ assignments and research projects reflect minimal use of technological information that could be obtained from the internet. This prompted the researchers to explore challenges militating against full utilisation of computers by lecturers in their teaching.

LIMITATIONS OF THE STUDY

This research could have been done on a cross-sectional survey to cover the whole of Zimbabwe, but finances for travelling limited the researchers to conduct the research in one province only. Since the research was not funded, the researchers were assigned to different stations so as to do the research concurrently instead of them studying the same station for a specified period of time.

a system where each variable has an influence on the other. Each institution tends to operate in an environment different characterised by history, culture, mission and profile that tend to distinguish it from other institutions as well as marketing it to its

potential clients. Colleges differ in the style of leadership typical for decision making about technology delivery. This has a clear impact on the operational scenarios and is an essential background dimension in a college's process of change and educational delivery.

Students are the main clients of the college and their characteristic wants and needs steer the institution in its programs and approaches. A group such as working people expect new services from the college and their influence will be a substantial contribution on the change process. Instructors bring with them their own histories with respect to change and technology in the teachings which in turn influence their willingness to adopt new forms of instructional methods. All the aspects mentioned under environmental conditions come together in various ways to steer the current policy of the institution relating to education and technology. These conditions determines the sort of new and partnership that the college may commit to in order to carry out its mission.

Given the policies that reflect the conditions within the institution, the next step in moving towards a scenario can be called implementation aspects. These may relate to the provisions made available in the college to teachers as well as to students. The combination of environmental aspects, policy, implementation, support and actual use in practise of technologies for educational uses will lead to perceived or verified set of results in the institution. These experiences and perceived effects will have an impact on the eventual commitment to educational delivery.

Perceptions on the Role of Computers In Education

Several studies carried out on teacher's perceptions on the role of computers have aired different views. A study by Blease (1986) on evaluating educational software reports that computer networks create opportunity for students to collaborate, cooperate and compete. In this way student learn by connecting their computers into a larger realm of information, resources and people. This means that computer technology can provide access to resources and facilitate teacher support and curriculum development. Development of computer digital libraries, for example, can compensate for the shortage of scientific journals. Since knowledge is dynamic the use of networks can help developing nations which have chronic shortage of books to have access to new knowledge.

Computer technology is increasingly being promoted as a way of enhancing the creativity and inventiveness of students. Siddiqui (2004) and Blease (1986) report specific aspects of computers

increasing creativity and inventiveness of students. Computers promote discovery with students constantly engaged in finding, designing and applying information in novel ways to solve problems. The use of computers aided design software can assist Textile, Clothing and Design students to design novelty patterns that can help them in producing unique garment designs. It could be noted from the above that computers technology has great potential to enhance achievement and teacher learning. This is also supported by Blissmer (1995)'s study of kindergartens. The kindergartens discover the letters of their names, identify shapes and learn to count while playing with well designed software. Still further in another study Blissmer (1995) indicates that college students examine facts of a very different world as they prepare multimedia presentations exploring their relative influence of monarchy and church on medieval life. The above studies indicate that even in Textiles and Clothing college students can engage in scientific inquiry through using prod ware to test moisture content of different fibres and graph their findings using spreadsheets. All these enable students to become active participants in meaningful learning.

The use of computer technology can foster the development of higher order thinking skills. Evidence can undoubtedly be marshalled in support of this belief. Research from several sources to include Honey (2000), and Hunter (1998) show a clear link between student achievement on higher level skills and computer access. Students learn how to organise complex information, recognise patterns, draw inferences and communicate findings. Consequently students exhibit superior organisational and problem solving as compared to students in more traditional classrooms. From the studies above it can be argued that the use of computers can provide an environment for learning in which students interact with the computer rather than respond to it in a pre-determined manner. Thus computers provide experiences that cannot be achieved by reading textbooks or watching film strips, movies or videos. Computer technology can enhance and ensure concept mastery by students of different learning styles. This is because instructional software is an infinitely patient non-judgemental one to one teacher that allows students to proceed through a topic at her own pace. Research studies by Honey (2000) note the value of computer for meeting the learning needs of all students. The studies recognise that not every student learns in the same way. Even though it is important to be able to process written information from printed pages, it was discovered that visual images sometimes provide missing clues especially in practical subjects like Textiles and Clothing. It was also noted that for some students the interactivity of the computer and the use of a mouse to touch the material will improve learning. For other students

repetition is necessary to get ideas. Video disks not only allow learners to view a film-clip of a process but allow them to see it over and over till the message sinks into their minds. The ability to organise information in different ways will capture the attention of some students while others benefit from seeing on the screen.

Earle (2002) notes that computer simulation programs can be used to teach core topics and to provide practical students with theoretical and simplified models of real world phenomena. Such programs can allow learners to investigate textile components through direct manipulation and experimentation. The computer based simulation and visualisation tools have been shown to lead to increased understanding of practical subjects' concepts. Thus in Textiles and Clothing the simulation of weaving process of fabrics can enhance the understanding of students on how fabrics are produced. The uses of computers have been commented for producing knowledge centred environments. Evidence in support of this has been given by Mean, Korbak and Michalchick, V (2000)'s GLOBE (Global learning to benefit the environment) project. The research showed that computers and the internet make communication more exciting by bringing real world problems into the classroom. For example, through the GLOBE project over one million students from more than twelve million schools around the world took part in gathering data about their local environment using protocols specified by the principal investigators. Students submit their data to the GLOBE data archive through the internet. The data was used by scientists to conduct analysis. Visualisation tools such as maps, graphs and digital photos on the GLOBE website enable students to see their own ideas to make comparisons with data collected in other locations. These knowledge centred environments which provide access to a vast array of information make students enthusiastic about their work while producing impressive intellectual achievements. Most literature on the use of computers in education notes the positive role of the computer in improving the achievement of students. Very few researchers have looked at the constraints of integrating computer in education. Efforts were made to answer the following research objectives;

- a) To examine the perceptions of lecturers on the intergration of computers as an instructional strategy?
- b) To analyse the challenges faced by lecturers in using computers in teaching of Textiles and Clothing?

METHODOLOGY

The design

The study of humans in working environments requires a qualitative approach in order gain a

comprehensive integrated picture of the behaviour of humans in their natural setting. A case study was the design used as it enabled the researchers to probe deeply and analyses the interaction between the factors that explain present status and that which influence change, (Gray 2004). Colleges are the once to teach the young generation hence should be aware of the use and impact of computers in this ever changing and technological world. Again the extent to which the impact and consequences of computers technology permeates the rest of society depends on how students teachers are made to experience the use of computers in their years of training.

Sample and Sampling Procedure

Three Teachers' colleges all located in Masvingo province were selected. Purposive sampling enabled the researchers to construct a better picture of the local, social and working relations by selecting respondents on the basis of noted problem, (Bell 1987). The study was carried among three heads of departments and fifteen lecturers teaching Textiles and Clothing from the three different colleges. This group was selected as it was perceived to be information rich on the problem under study.

Instrument

Data collection techniques complemented each other in eliciting data. In-depth interviews, unstructured interviews and observations were the data collection techniques employed. In-depth interviews were conducted with the Head of departments of each college and unstructured interviews were conducted with lecturers from all the colleges. The observation schedule was designed in order to capture computer use during lecture hours.

DATA COLLECTION PROCEDURE

Permission to administer interviews to lecturers was sought from college authorities. Appointments to lecturers were then booked. Data was collected over a period of twelve weeks.

DATA PRESENTATION AND ANALYSIS

Analysis of data involved compiling the summaries of emerging themes pertaining to the views and challenges faced in integrating computers. Major themes were developed using the objective approach.

FINDINGS AND DISCUSSIONS

The discussion covers the findings of the two main research objectives. These findings were interpreted using data collected through the gathering techniques that is interviews and observations.

The demographic characteristics of respondents focused on age, teaching experiences, qualifications of lecturers and professional training taken with a computer component course. On the basis of data gathered, three of the lecturers were aged between

thirty-six to forty-five years. This group again had more than fifteen years in the teaching service. Age and teaching experience were useful to this study because the researcher had assumed that the lecturers with longer service in the system tended to influence the junior ones on the use of computers. This might be attributed to the ability to bring with them their past experiences with respect to change and technology. The lecturers' past experiences would in turn influence their willingness and capacity to adopt new forms of computer technology. Gatawa (1990) asserts that more experienced teachers tend to be very conservative and see change as a threat to their security. Data obtained showed that the junior lecturers who are young and had very little teaching experience were not utilising computers as well. Both the senior and junior lecturers showed that they were unsettled with the use of computers in the teaching of Textiles and Clothing. The data also revealed that all respondents were females. This pattern could be attributed to patriarchy in the traditional African society where subjects like Textiles and Clothing were mostly taken by women. Thus some African societies still believed that sewing remained the female's duty.

a) **Perceptions of Lecturers on the Integration of Computers as an Instructional Strategy.**

The first objective sought to establish the perceptions of lecturers on the integration of computers in education. Lecturers aired views that were related to their belief and skills concerning the use of computers in education. Emerging firstly was the participants' views regarding the position of the computer in the classroom as revealed by the excerpt below

'We should not be forced to change everything completely because we do not have skills, these computers should be part of the existing teaching methods'.

This statement implies that respondents considered that computers were to be used to compliment rather than completely change existing teaching strategies. This theme that emerged is well supported in literature. Mean et al (2000) support the idea that change activities in education should fit the existing skills of teachers. Again in a nationwide survey simultaneously with case studies on the use of computers, Watkins (2000) concluded that teachers beliefs and their resulting teaching styles change very little over time. This means that effective use of computers in the teaching of Textiles and Clothing depend as well on the views and beliefs lecturers hold. These views could change as they acquire more skills and experiences on the use of the computer.

Stemming from the same objective is that lecturers posed views that were more of factors that impinge upon their use of computers. These impediments were more of external factors than those identified in objective two. From the data obtained respondents

raised that the education system had not kept up with the pace of computer technology as evidenced by the excerpt below,

'A-a education is always the last to use these computer technologies hence integration is not being done effectively'

This statement implies that the use of technological changes like computers is a slow process and is not radical even at colleges. The slow pace might be compounded by poor funding in the education system. This reasonably makes it difficult for the department like Textiles and Clothing to keep pace with which technology is evolving.

A number of research studies focussing on change in education confirmed that change is generally not accepted and takes time to be fully implemented, (Hassan 2004; Siddiqui 2004). These studies mentioned and concluded that there are several impediments that interfere with the process making it very slow. Siddiqui (2004)'s conceptual model (fig 1) even offer greater support to the data obtained from the respondents. The model pointed out that there are many variables that affect the process of utilising computers. These range from environmental conditions, policies response, and implementation practises and experiences effects. All these variables form a complex system where each variable has an influence on the other making the process of computer technological use very slow.

Lecturers indicated positive feelings about computer technological effects on personal work and study conditions. Thus respondents oversee the use of computers with great potential of transforming the teaching and learning of Textiles and Clothing. This quality could be brought about by the ability of computers to encourage creativity and the flow of current information. Respondents also pointed out that computers would enhance concept mastery. These views of respondents were, however, in sharp contrast with Hasan (2004)'study. In the study computers were made lavishly available to teachers and students. Yet according to the study the use of computers yielded no clear and significant effect on student learning. This might imply that the mere availability of computers in education provides no guarantee that the quality or relevance of education would improve. It could be noted that as respondents aired their own views of which they had never seen nor tested any group, quality might in one way improve as studies by Blissmer (1995) and Blease (1986) report specific aspects of computers increasing the creativity and achievement of students. It was discovered from the studies that the students were constantly engaged in finding, organising, and applying information in creative and novel ways to solve problems using the computers.

Respondents especially lecturers were worried about the negative effects of computers networks like internet as remarked below,

'The internet is rather breaking our cultural values, where then will quality come from'.

This excerpt implies that lecturers felt that quality would not be achieved through the use of computers. It was indicated that the internet is distorting cultural values. Students as well as lecturers ended up simply copying and translating material on the internet without considering their social and educational contexts. While it is true that cultural values are being distorted, it should be pointed out that computers are fast becoming part of our daily lives. These computers are even affecting people's life styles and the way students learn. This may even show that while traditional values may be distorted, they are being replaced by more fluid structures which form patterns of inclusion on the global scale. Computers should not be rejected on the fact that the internet is said to be interfering with cultural values for culture itself is dynamic.

The second objective sought to identify and examine the challenges lecturers face from using computers. Two major categories of challenges were discerned. These were the challenges at lecturer level and those at college level. Lecturer level challenges however outweighed college factors in explaining why lecturers were discouraged from using computers as quoted below,

'I cannot even prepare any slide, never come across PowerPoint, Spreadsheets what are they? I can prepare slides but putting the information online is the problem'.

These excerpts implies that computer use in terms PowerPoint, spreadsheets, and internet had not become standard as part of teaching and learning of Textiles and Clothing. Lack of adequate technical knowledge and skills on the use of computer software had emerged as the greatest factor affecting computer use. The lecture method remains the core medium of instructional form that is being highly valued. Whilst it was observed that some could prepare slides using PowerPoint, they lacked skills and knowledge on how to put the information online so that students could get the information at any computer point within the college. This revealed that lecturers who were expected to integrate computers had never been exposed to a variety of possibilities for applying computers in teaching.

Another factor that had emerged regards the lecturer's role in the use of computers and how this relates to their actual work loads and job satisfaction. Lecturers were noted to be doing nothing with computers even word processing their pieces of assignments or tests. Lecturers prepared their

material and assigned technical assistants or typists to do the typing of any piece of work as quoted below,

'I can word process but rather prefer to give all work to typists for that is their job description.'

This showed that the issue of division of labour at the college is affecting lecturers from doing more with computers. Lecturers had the feeling that they exercise full control of the mere teaching and marking. It can be deduced further that the lecturers were reluctant to relinquish control over the learning process and were not interested in keeping abreast with technological changes.

Poor job satisfaction was identified as affecting the use of computers by lecturers. This poor job satisfaction as had been noted could be compounded by poor conditions of service in the education system as evidenced by the excerpt below,

' Using PowerPoint what for, burdening myself with a lot of work with very little pay. I will simply lecture and dictate notes'.

The above statement shows that lecturers felt that taking an extra mile through preparation of slides for teaching is a burden as their pay versus amount of work did not tally at all. This greatly indicates that there is very low motivation among the lecturers. The use of technology is not motivating them at all.

College factors played an important role on how lecturers made use of computers. Though the college had made strides in acquiring computers, it had, however left the in-cooperation and use to individual lecturers. The college had no definite policy about the use of computers by students and lecturers. It was noted that even if students were asked to submit word processed assignments, they gave so many excuses that lecturers ended up resorting to hand written ones. This therefore indicated that lecturers were left in a difficult situation of which neither moral nor support in form of a policy that guides students were offered. This finding is also noted in literature that the implementation of any change in education should not be left to individual teachers only, (Honey, 2000; Hasan, 2004). This therefore means that support in form of a policy is very crucial as it guides both students and lecturers.

Stemming as well from the same research objective is that computer hardware was of very poor quality and not enough. Appropriate software was again another factor that affects use of computers. The Textiles and Clothing department had no appropriate computer aided software and hardware. As lecturers were noted to be in the learning phase of using computers, good quality hardware could have made a difference to their use of computers. Another feature that came up is that of time. Lecture periods with the use of

computers and again lecture periods with the use of the lecture methods were just the same in terms of time allocation. The issue of time factor was not revised at all. The time to cover examination content limited lecturers from using computers effectively. Lecturers pointed out that it was better to cover course content that would be examined at the end of the year, yet there was no examination that is computer written or examined at the college.

CONCLUSIONS

The findings of the study unveiled several facts about the use of computers in Textiles and Clothing. From the views raised by lecturers, it could be established that the use of computers as a teaching strategy is part of the process of change that is very slow. This could be compounded by the fact that the college had not kept up with the pace of technological advancement due to limited financial resources. This led to difficulties in acquiring computer hardware and equipment to use even in departments such as Textiles and Clothing. It was also established that the major challenges faced by lecturers from using computers were the lack of adequate knowledge and skills on the application of computers in teaching. Lecturers who were supposed to integrate computers were never exposed to a range of possibilities on the use of computers in teaching. Poor job satisfaction among lecturers due to poor conditions of service in the education system militated lecturers from using their time to experiment with the computer in teaching. It was again concluded that the college lacked a clear cut policy that guides lecturers and students on the use of computers. As has been indicated by Siddiqui (2004), the current policy of the institution relating to education and technology is very crucial as it determines and reflects the conditions within the institution, the sort of new and partnership that the college may commit to in order to carry out its mission.

RECOMMENDATIONS

From the findings it could be recommended that every effort must be made by Higher Education ministry to adequately prepare lecturers at universities and training colleges through in-service courses that feature high quality training that would enable lecturers to integrate computers in their teaching. As the use of computers is part of the process of change that is slow, is essential that college administrators be well focused and persist in their support on the use of computers by all lecturers through policy formulation that encourage the use of computers in their teaching.

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