

Using Information and Communication Technology at the University of Zimbabwe: challenges, successes and recommendations

Admire Kachepa
Polytechnic of Namibia

Oksana Batchaeva
University of Zimbabwe

Abstract

Information and Communication Technology (ICT) is now an essential service for the effective administration of businesses including colleges and universities. The same technology finds use in the teaching and learning activities. This study looks at how this technology is being used at the University of Zimbabwe as an administrative tool and as a teaching and learning tool. Three faculties from which, ten departments, fourteen lecturers and ten students were used as participants in the research as source of studied information. Further to that students were observed as they used the service at the Library, Economics computer laboratory and Commerce computer laboratory. Technical people responsible for day-to-day operations of the ICT infrastructure were also interviewed. The study shows that while use of the technology is now widespread, there is no policy framework at department and faculty level to ensure its effective use. Teaching staff proved to be competent in the use of the Internet and e-mail, however students did not comprehend some of the ICT terminology. It also emerged that the ICT services were not fully exploited. The study recommends the setting up of faculty and department ICT co-ordinators or committees with specific roles that champion the effective use of ICT services. Further to that ICT should be part and parcel of a general curriculum for all university students. ICT is a dynamic area needing research and updating all the time. Further research is needed in all the faculties to see how staff and students are coping.

Admire Kachepa holds a Masters of Science Degree in Applied Mathematics and Computer Science (Specialisation: Computer Science) from the Russia People's Friendship University. He was a Lecturer in the Computer Science Department at the University of Zimbabwe before joining the Polytechnic of Namibia in 2006. He was also a part-time Lecturer at the Zimbabwe Open University (ZOU) where he taught Computer Science and Mathematics courses. He is the current Head of Department of Basic Computing at the Polytechnic of Namibia. He has written several Modules in his field of specialisation. E-mail: akachepa@polytechnic.edu.na

Oksana Batchaeva is a researcher who started teaching 14 years ago after finishing her first Masters degree in Physics in Russia. In 1995 Oksana graduated with an MBA degree from People's Friendship of University and worked as a manager for a private company. In 1996 she relocated to Zimbabwe and taught Physics, Mathematics, Physical Science and Computer Studies at high school level. She was also a part-time Lecturer at the Zimbabwe Open University (ZOU). In 2007 she obtained a Masters degree in Mathematics and Physics Education from the Department of Science and Mathematics Education, Faculty of Education, University of Zimbabwe. E-mail: obatchaeva@yahoo.co.uk

Introduction

The University of Zimbabwe is a state institution. Its student enrolment is around

11 494, with an academic staff establishment of 1 268 and 1 054 support staff. There are ten faculties i.e. Agriculture, Arts, Commerce, Education, Law, Medicine, Engineering, Science, Social Studies, Veterinary Science and support services such as Library and Central Administration.

Computing developments prior to 1996, were fragmented with individuals or departments taking their own initiatives to develop computing facilities. Computing Laboratories were spread across faculties with no link. The establishment of comprehensive Information and Communication Technology (ICT) facilities followed the 1996 Computer Committee Paper CCM/4/1996, which provided broad guidelines for the development of Information and Communication Technology. Several factors gave rise to this and the primary one being that an aggressive use of Information and Communication Technology is seen as an indicator of a progressive institution, secondly Retrenchment left lecturers vulnerable and this is why there was need for knowledge of ICT quickly, thirdly industries now expect graduates who are capable of using Information and Communication Technology in the work environment. This resulted in the inclusion of the Campus Wide Information System in the University of Zimbabwe's five-year strategic plan 1997 - 2002. The Computing Services Centre (Computer Centre) was restructured and mandated to spearhead the development of Information and Communication Technology Services.

Since then various developments have taken place, including the setting up of a Campus Wide Information System backbone, installations of Campus Wide Client-Server Computer System and provision of Internet/Intranet connectivity to almost all buildings on campus. The introduction of Campus Wide Information Systems triggers changes in an organisation's culture, structure and policies. In their paper (CCM/4/96) Madungwe, Hapanyengwi and Mlanga had this to say about technology:

Technology is a vehicle for delivery of information. The important component in the whole cycle being information. Whoever controls the information source has infinite control. Hence the way we develop our information systems is an indication of the level of control that we have for our destiny. This has a big impact on how we implement technology systems to deliver information and policies that keep us focused on corporate objectives. (Madungwe, Hapanyengwi and Mlanga CCM/4/96)

ICT impacts on how organisations are formed, operate, strategise and deliver service. Information Technology is one of the largest sources of change in organisations today hence successful use of information and communication technology requires an understanding of the basic concept of organisational change. It is a competitive necessity. To benefit fully from ICT, organisational changes are needed.

Services such as e-mail, Internet, www, ftp and common numerous others are

now available to a sizeable number of staff and students. There are, however, a number of socio/economic and socio/political challenges surrounding the establishment of ICT. Some of these issues include committed ICT leadership, sound planning, ensuring high productivity and motivation of staff to use ICT.

This study sought to gain insight into the workings of the University of Zimbabwe Campus Wide Information System. It closely follows Appreciative Enquiry dictates in determining those things going on well and how this can be shared across campus. There are many things going on well that ought to be highlighted.

The case study approach was the chosen method because it enables the researchers to examine the extent to which ICT facilities are being used for administrative purposes as well as for teaching and learning. It makes it possible for researchers to look more closely to how, when and who is using ICT and allows the researchers to focus on current use trends.

A case study is an examination of a specific phenomenon such as a program, an event, a person, a process, an institution or social group. The bounded system, or case, might be selected because it is an instance of some concern, issue or hypothesis. (Merriam, 1988)

Statement of the Problem

Information and Communication Technology infrastructure is now part and parcel of University of Zimbabwe life, it is unclear as to how it is being employed i.e. specifically what exactly is happening. The establishment of the ICT set up is a heavy investment in terms of the financial, human and time resources employed to set it up and keep it going. How then can it be justified? It is necessary to perform a return on asset evaluation so that an understanding on how the institution is benefiting from it is gained.

Research Questions/Sub-Problems

Arising from the stated purpose of the study the following research questions are given:

- Is there departmental/faculty policy towards ICT?
- Are there any administrative improvements that has resulted from the establishment of ICT?
- How competent are staff and students in using ICT services?
- What information on the Intranet/Internet do staff and students most frequently use?
- What information has the department/faculty generated which is kept on the CWIS?
- What technical issues has arisen owing to the setting up of the Campus Wide Information System concerning hardware, software and organisation?
What is exactly in place?

Significance of Study

Given our view that the establishment of Campus Wide Information System was a serious, costly and strategic investment, we hope planners will be able to gain insight into how this investment is benefiting the University and how usage of ICT

can be optimised in order to improve service delivery. Administrative costs could be reduced, academic productivity increased and shortcomings corrected.

Delimitations of Study

The study is concerned with ICT service access, usage, relevance, responsiveness, and appropriateness. This involves identifying ICT facilities in faculties and units and how students, staff and administration use them as well as how such usage is affecting organisational arrangements. Three faculties i.e. Arts, Education and Medicine from which, the chairpersons, teaching staff and students were interviewed and observed form the focus of the study. The study deliberately left out other faculties such as Science and Engineering because by their own virtue these faculties are computerised and the students and staff use the ICT services on a daily bases.

Trends

Studies are ongoing at various universities on the many aspects of Information and Communication Technology, electronic journals such as Campus-Wide Information System, Journal of Educational Administration, Information Management and Computer Security, Information Technology and People, Technology Today and many others have provided the bulk of reviewed literature. No research has been done in this area at the University of Zimbabwe and this is why there is no much local literature in the area.

Tellis (1997), whose study inspired this study, researched on the characteristics of technology acquisition, computer use categories and managerial issues surrounding CWIS infrastructure at Fairfield University. He recommended for short planning cycles and that users had to be involved in all stages. This study, however, focuses on the use of Information and Communication Technology at the University of Zimbabwe for administrative purposes and for teaching and learning purposes. The review was divided into the following parts:

- What is a Campus Wide Information System (CWIS) and what is Information and Communication Technology (ICT).
- Uses of ICT in Administration.
- Uses of ICT for Teaching and Learning.

What is a Campus Wide Information System (CWIS) and what is Information and Communication Technology (ICT).

To remove any ambiguities it is important that a shared understanding of CWIS/ICT be established before proceeding. Information and Communication Technology is at the core of modern Information Systems (IS) i.e. an Information System in an organisation is the total apparatus for handling information in all respects (Chapman and Oliver 1992:1). From this we can broadly identify what is broadly termed a Campus Wide Information System (CWIS). Suits (1995), refers to it as a system that provides all members of a university community with access to the huge stores of data that reside on campus and on computers throughout the world. To be appreciated it should be accessible from anywhere, at any time, be usable by anyone who wants to, is user friendly, easy to update and maintain and contains enough information which is compelling and entertaining to users.

The term Information and Communication Technology is a generic term used to define or refer to the technologies being used to and for collecting, storing, editing, and passing information in various forms (Jager and Lokman 1999). Information and Communication Technology (ICT) is synonymous with Information Technology (IT), ICT is preferred because of the emphasis on the word communication. Chapman and Oliver (1992:7) describe Information Technology as the technology, which supports the activities involving the creation, storage, manipulation and communication of information together with their related methods, management and application. We may safely say that ICT/IT is the broadly based technology that is needed to support Information Systems.

Uses of ICT in Administration

To effectively manage or administer the affairs of the university many services are provided on a day-to-day basis. The University of Zimbabwe has set the following strategic targets i.e. Quality management, Excellence in Teaching, Learning, Research and Service (UZ-5 year Strategic plan: 5). A CWIS should be a vehicle for information delivery (Madungwe, Hapanyengwi and Mlanga CCM/4/96:7). Wiggins (1994), listed those items he believed were essential so that the administrative function could be assisted, some of the items expected to be present on a CWIS are student enrolment procedures, catalogues, calendars, academic advising, people directories, library details etc. On the University of Zimbabwe administration web page the CWIS is supposed to service student registration, examinations, accounting, human resources, payroll, finance and facilities management (www.uz.ac.zw/admin/itadmin).

At his website www.ictineducation.org Freedman (2002) says a lot of administrative burdens can be relieved by using computers and ICT wisely. He lists activities such as examinations entry, registration of students, informing people, scheduling, data analysis, lesson plans and preparation, timetabling, publicity and image, diaries, departmental handbooks, budget and capitation. Obviously many other things can be added but the above activities are critical to effective administration.

Penrod (2003), believes that IT should impact the daily operations and functions of a university, it should relate directly to the mission of the institution. To quote some of his words he says,

“To be effective Information Technology services should be aligned to the influence systems of organisational culture, structure, internal economy, tools and rewards.” Penrod (2003)

Penrod further urges for Information Technology to link specified objectives to managers, teams and units. This requires strong collaboration and understanding of higher education trends with regular, cyclic feedback from all directions. An administrative system houses an institution's core data and enables staff to execute the processes that support the business of education such as student registration, applications processing, payroll, etc. (Moul 2003).

After his research Kobulnicky (1999) observes that there is hardly any decisions over how technology will be used as a tool to enhance the success of mission critical activities. He concluded by saying that to achieve intended goals any investments

in IT should be derived from sound business plans. He summarized his paper with this:

Investments in IT should be designed to decrease costs, increase income, redirect human resource utilization to free faculty (teachers) to derive greater rewards for themselves and the institution. Finally academic planning on our campuses must become more resource driven, with IT seen as an investment opportunity with expected returns.

A major administrative function is communication, it is the most important function in an office, and it determines considerably office productivity. Communications support almost all organizational activities (Raggad 1997). It is therefore imperative that ICT is seen to enhance clerical and managerial productivity in offices across campus through the use of electronic mail, file transfer protocols, visuals etc that improve the profile of an office. The activities that occur in an office include managing documents, managing schedules for individuals and groups, managing projects, communicating with groups and individuals, managing data and managing decisions. Hicks (1993: 192) identifies three basic types of communication i.e. voice, text and image (graphics, pictures, drawings and moving video images). ICT can be applied to automate communication functions.

One of the areas of concern facing higher education is the ever changing environment, it is important that ICT optimises the ability of institutions to respond to the new environment (Guan, Nunez, and Welsh 2002). A good example is the economic and social climate prevailing in Zimbabwe. Guan, Nunez and Welsh (2002), also note that university decision makers, planning and budget administrators, still lack critical information necessary for decision making even though the information already exists in the organisation. This is so because most of the captured data needed for decision-making is inaccessible. The researchers cited above conclude that information systems should be viewed as critical to decision making.

An issue of current concern is who should own the CWIS, i.e. a computer centre, library or the public relations department. Suits (1995), strongly believes that it should be the responsibility of the information office or public relations office as they are better and well trained in information handling. However, given the static nature of university management structures (McInlon 1998), those who administer information systems are relegated to a secondary place.

To strengthen organisational administration one expects to see the following management support systems in place i.e. Management Information Systems (MIS) that provide routine reports used in controlling and monitoring businesses, Decision Support Systems (DSS), i.e. interactive systems used in solving semi-structured business problems and finally Executive Support Systems (ESS) used by senior managers to monitor and control businesses (Laudon & Laudon 1991:512). Information Systems can be used to gain competitive advantage (Hicks 1993: 105).

Ideally, the establishment of ICT should transform educational management through the removal of unresponsive and bureaucratic structures. It should result in management that is student focused, adaptable, collaborative, market oriented and transcending time (Uys 2002). Computers perform many of the routine tasks that used to be done manually more efficiently and faster and ICT lets users produce

output in greater quantities and of better quality (Hicks 1993).

To summarise the uses of ICT in administration I quote French (1996) in his presentation at the University of Hong Kong.

Clearly technology has brought both enhanced productivity and reduced costs to some parts of higher education. Like many corporations, campuses routinely and effectively use technology in many administrative areas. As in the corporate domain, computers have improved productivity related to a wide range of data management and transaction processing activities: personnel files, course schedules, library catalogues, budgets and accounts receivable, student transcripts and admissions information. Moreover, in some parts of the faculty domain, technology has truly helped to increase productivity and reduce operating costs. Indeed, a generation of faculty has come into academic positions with little or no secretarial assistance from their departments or institutions: they have a computer to prepare their own class materials, course syllabi, conference papers, grant proposals, manuscripts, and other documents. As of yet, however, relatively few would claim - even after a dozen years into the "micro" revolution - any real gains in instructional productivity. In that realm, as ever, we're still left with the "promise" of technology.

Uses of ICT for Teaching and Learning.

Given the exponential growth of the information required for one to survive, many universities seem to be very serious about exploring the potential of using technology and ICT in particular as a way to facilitate the creation of enhanced learning environments. Changes in attitudes and policies must take place at these institutions if they wish to ensure that their best teachers are engaged in the process (Butler 2001). Matula (2002) commenting on e-learning developments at the University of Botswana said the deployment of ICT at that university was done to optimise the learning environment, to improve the education process, reduce costs and the high numbers of students. ICT provides for the rapid movement of information.

Unless leadership at universities has an ICT vision, understanding for its role and impact as a tool for teaching and learning its adoption will be difficult. ICT has to be part of the curriculum, goals and objectives of an institution (Yuan, Law and Wong 2003). Transformation to ICT requires not only excellent resources and funding but also a vision and institution wide cooperation.

E-Learning is regarded as better than face to face learning in some circles, (Kassop 2003), gives the following reasons for that i.e. it is student centred, makes students write more, is highly interactive, it promotes life long learning, feedback is immediate, it is flexible and fosters an intimate community of learners while developing and motivating teachers.

UNESCO in their publication *Information and Communication Technology for Teacher Education, a Planning Guide* (2000) raised interesting issues such as that ICT skills have to be learned by students and teachers alike to face the 21st century. ICT has become a major factor in world economy, which is now knowledge

based. To effectively harness ICT potential there has to be access, good content, and teachers who have the knowledge and skills. ICT competencies for teachers include the ability to come up with good content, pedagogy, technical abilities, and collaborative abilities and be networked.

A key point raised in the UNESCO document is that colleges, stakeholders etc. must have a common vision for ICT so that the technology can be infused into the entire education programme where the powerful ICT tools are used to change the present teacher-centred and text bound classroom into rich student focused, interactive knowledge environment.

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n their study on Integrating ICT Across the Curriculum, Leask and Williams (1999), observe that a supportive and collaborative school ethos is very necessary. They discovered that most teachers had no ICT training. The development of ICT based learning requires confidence, enthusiasm, teamwork, the right framework and a focus on the learning outcomes Leask and Williams (1999:206).

At Dickson College, USA, Laws (1997), found out that student mastery of difficult concepts was significantly raised after the redesign of the teaching methods of the physics course using computer-based tools such as data analysis, graphing models. Chenoweth and Price (1997), studied developments at the East Tennessee University where the General Education Curriculum has been modified to include a "Using information technology component". A major feature of this component is that students should be proficient in the use of ICT by the time they graduate. To meet that requirement students have to learn word processing, e-mail, file management, use databases, Internet and other computer based applications. The reason for this has been the need to have technology literate graduates.

The effectiveness of teaching and the enhancement of learning are all possible when the Internet is used, however the technology is generally under-utilised. Verma and Parikh (2001), proposed a framework for effective utilisation of the Internet in business education by identifying the activities performed by students during a course and through their ActiveBook framework designed tools to help students perform these activities remotely and more effectively.

Jagar and Lokman (1999) in a paper to the European Conference on Educational Research proposed these functions of ICT in education i.e.

- Learning about ICT so that students can use ICT in education, future occupation and social life.
- Use ICT as an assisting tool e.g. making assignments, collecting data and documentation, communicating and conducting research.
- Use ICT as medium for teaching and Learning, i.e. as a tool through which teachers can teach and learners can learn.
- Use ICT to organise and manage schools.

In their research they found out that the under utilisation of ICT infrastructure was because teachers lacked educational designing skills, teachers need to be more and more counsellors of the learning process. They further noted that the implementation of ICT could not be realised by blueprints. Schools and teachers should learn and be able to design their own educational situation, choosing from the varied potential ICT has to offer.

In their response to Educom's National Learning Infrastructure Initiative (NLII), Massy and Zemsky (1996), point out that ICT can enhance academic productivity and improve the learning experience given that it:

- Provides access to enormous quantities of information available through the Internet and on-line databases;
- Eases the limits of time and space for educational activities;
- Brings the best lecturers to students via multimedia so that "those of the best will drive out those of the merely good" ;
- Enables self-paced learning, sensitivity to different learning styles, and continuous assessment of progress;
- Makes the teaching and learning enterprise more outcome-oriented, which enhances the ability of institutions to stimulate experimentation and innovation;
- Increases learning productivity, especially in areas of "codified knowledge and algorithmic skills" (p. 4); and,
- Empower students to have greater control over the learning process and benefits associated with active learning and personal responsibility.

Sell (1997), at the University of Northern Iowa in his paper, Challenges In Using Technology for The Improvement of Undergraduate Education, observes that through www, CD-ROM, online databases and multimedia presentations, ICT offers increased accesses to more and better information resources, brings availability of alternative mediums that accommodate different learning strategies, increases motivation to learn and the potential for individual and cooperate learning.

Musick (1997), says that technological skills and self efficacy with computers is fundamental to education, without it schools and the education systems is crippled. A graduate student who is techno-phobic is potentially unemployed.

Knowledge today goes beyond rote learning and test performance. It includes the ability to search for information with all available media, to utilize technological tools to accomplish a variety of tasks, and to display their concepts and ideas in three-dimensional form using multimedia. To do this, students must be self-efficacious in the use of computer technology. (Musick 1998).

Baker (1997) at the Society for Public Health Education conference listed the following advantages of ICT i.e. it is speedy, efficient, low cost, ease of information dissemination and access, convenient. She went on to say that the Internet enables dialogue through e-mail and chatting, allows economies of scale, mass customisation, self paced learning, decreases the limitations of time and space, privacy, safety and timelessness. She also noted that inadequate infrastructure can hamper usage including poor access and the need for learning to use ICT.

Major concerns on using ICT arise from the overwhelming amount of information,

which at times is poorly organised, of inconsistent quality, redundant and biased with no peer review. It is worrying that undocumented, misleading, incomplete, inappropriate, inaccurate, and outdated information already proliferate on the Internet and in other forms of information technology.

From the above information one can conclude that ICT is a key component of the education process. Continued review of its use is however needed so that effective use is realised. The following outlines the methodology to be used in this study, hopefully some of the noted issues in this review will be noticed and some good practices observed that could be shared by universities.

Subjects

These were the research participants used in this study and make up the unit of analysis. The target population was the entire university community. Three faculties i.e. Arts, Education and Medicine were selected for reasons of accessibility, willingness to assist in the research and time available to conduct the study. The following departments were used in the research, i.e. Modern Languages, Linguistics, Theatre Arts and Religious studies from The Arts Faculty, Curriculum and Arts Education, Science and Mathematics Education, Technical Education and Adult Education from The Education faculty and finally Anatomy, Pharmacy and Physiology from Medicine Faculty. The Chairperson, one lecturer and one student was interviewed from each of the departments. Besides that senior administrators and senior technical staff were interviewed i.e. one from the Computer Centre, Student Records, Bursar's office, Information Office, Central Administration Information Technology manager, Arts Faculty and Education Faculty.

To select administrators and ICT engineers judgemental sampling or purposive sampling, (Cohen and Manion 1997), was used because of personal knowledge and opinion on the subjects and their expertise which provided desired insights. For selecting students and lecturers stratified sampling was chosen so as to divide the population into homogeneous groups by faculty and specialisation area. The lecturers and students were then randomly selected from different faculties.

Data presentation and discussion

All the interview and questionnaires responses were analysed with a view to answering the questions and sub-questions presented earlier on. The focus of this study had been to establish how, when, who, and for what purposes ICT was being used. Of major concern had been the need to find out if any policies had been put in place at faculty and department level to promote the use of ICT services.

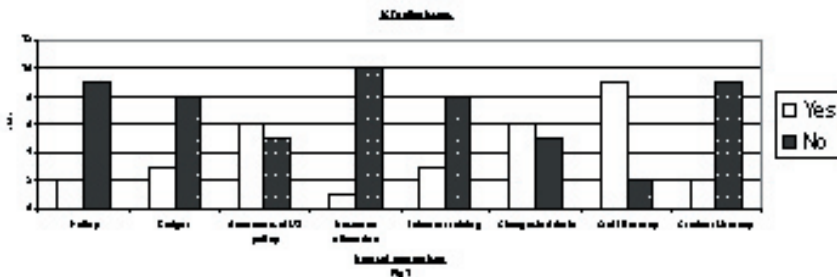
Is there a departmental or faculty policy towards ICT?

This is one of the core questions studied, policies i.e. courses of actions adopted by a department or faculty determine how effectively desired outcomes are achieved; in the case it is the effective use of ICT services. Table 1 below presents the findings from the study on policy and policy related questions.

Table 1
Departments positions on policy and other ICT issues

	Yes	No
Do You have Policy or Strategy on effective use of ICT?	2	9
Do you have a budget for ICT?	3	8
Are you aware of UZ ICT guidelines?	6	5
Are ICT resources equitably allocated?	1	10
Do you provide in-house training for staff and students?	3	8
Do you see any changes in the way you administer/communicate?	6	5
Is staff computer literacy good?	9	2
Is students' computer literacy good?	2	9
Is there effective ICT support staff?	3	8
Probabilities of yes or no response	0.353	0.646

In table 1 nine questions requiring a negative or positive response were asked. Of the 99 possible response combinations, 35 were positive and 64 negative. The probability of getting a **yes** was 0.35 and that for getting a **no** was 0.65 (see Table 1). The differences between **yes** and **no** responses are clearly illustrated Figure 1 below.



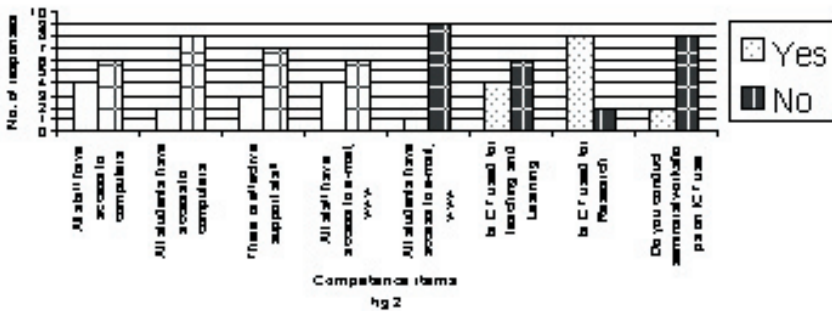
The same group of chairpersons were asked to rate their staff's competence and the staff support available. Table 2 below illustrates their views.

Table 2
ICT support for Teaching and Learning

	Yes	No
All staff have access to computers?	4	6
All students have access to computers?	2	8
There is effective support staff?	3	7
All staff have access to e-mail, www?	4	6
All students have access to e-mail, www?	1	9
ICT is used for teaching and learning?	4	6
ICT is used for research?	8	2
Do you conduct seminars/workshops on ICT use?	2	8
Probability	0.35	0.65

Eight questions were asked needing a yes or no answer. 28 responses were positive and 52 negative. The probability of a yes response was 0.35 and for a no it was 0.65. Please note the fact that in the two Table 1 and Table 2, the probability of getting a **no** or a **yes** was the same. See also figure 2 for a graph illustrated the **yes** and **no** responses.

Responses by chairpersons on staff and student ICT competence and support



Administrators’ responses were reflected in the table below.

Table 3
Administrators position on policy and other ICT issues

	Yes	No
Do you have a policy on ICT?	2	3
Do you have a budget for ICT?	0	5
Do you have ICT support staff?	1	4
Do you use electronic forms	2	3
Probabilities	0.25	0.75

Only four questions were posed, they needed a yes or no response. Five of the responses were positive and 15 were negative i.e. the probability of a yes was 0.25 with a no at 0.75.

Teaching staff and students competency

Questions posed to teaching staff and students sought to establish how skilled they were in using ICT services and for what purpose they were using the service. Table 4 presents the findings on teaching staff competences and table 5 presents findings on students ICT use competency.

Table 4
Teaching staff competence

	Skilled	Working Knowledge	Unskilled
Word-processing	6	5	2
Spreadsheets	2	4	7
Data bases	2	1	10
Internet	7	5	1
E-mail	10	3	0
Teaching and Learning use	2	8	3
Multimedia presentations	1	5	7
Probability	30	31	30
	0.33	0.33	0.33

A total of seven skills i.e. abilities to use or apply computers were evaluated. Three measures, namely skilled, working knowledge and unskilled were used. The number of those skilled in the use of e-mail and Internet was high while those who could not use data base applications and multimedia presentation tools were also high. Statistically all the measures had a 0.33 probability and 0.66 of teaching staff were skilled in using ICT services. See fig 3 for an illustration in graph form.

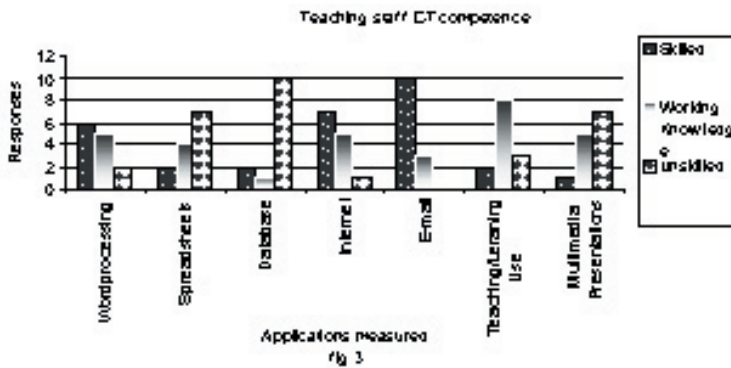


Table 5
Student Competence

	Very Good	Good	Beginner	Unskilled
Start computer program	2	3	2	1
Access the Internet	1	2	4	1
Word Processing	0	2	0	6
Access information on CD-ROM	0	3	0	5
Spreadsheets	1	2	0	5
Database	1	0	0	7
Presentation Application	1	2	1	5
Probability	6	14	7	30
	0.1	0.25	0.12	0.53

Some students found some ICT terminology unfamiliar, a high number was unskilled in the basic use of ICT applications such as word processing and database use. Those skilled made up one percent and those unskilled made up 53%. See figure 4 and 5 below show the graphs.

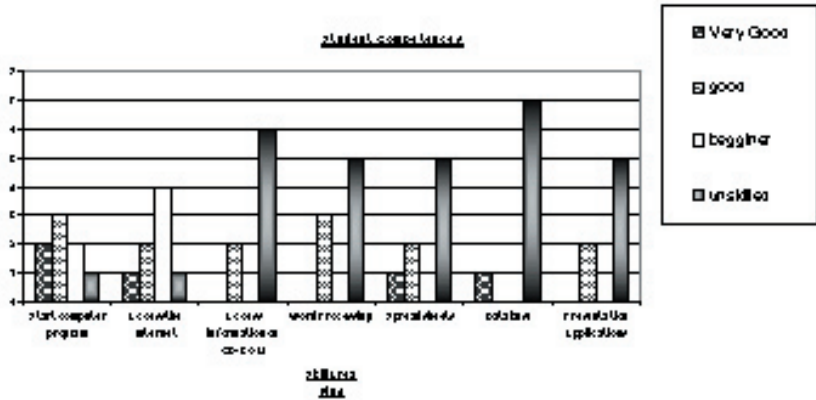


Fig 5

Students were also observed as they worked on computers and below is a list of the activities noted and the percentage time for each observed activity.

E-mail	50%
Internet	30%
Word processing	10%
Other	10%

E-mail and Internet access preoccupied most student computer time. Those wishing to do other activities such as word processing etc, complained about lack of equipment. This was obvious given the numbers queuing to use computers at the library, time each student could spend on a computer and lack of training to in other applications. See Figure 5.

What information do departments and faculties generate that they keep on the CWIS?

A review of material available on department and faculty websites is presented in table 6 below.

Table 6
Department information on www.uz.ac.zw

	Yes	No
Dept history	3	8
Academic advisory	0	11
Outreach programmes	0	11
Upcoming events	0	11
Contact e-mail	3	8
Is information curent ?	0	11
Courses outline	2	9
Pointers to archived information	0	11

Much of the information on the websites is redundant and outdated e.g. staff members listed are no longer with the university, chairpersons listed are not the ones in office and e-mail addresses given are not functional, not university related while listed events are several years past.

- Most departments have vision statements that date back to 1998 and do not say anything on ICT use.
- Three departments have a catalogue or course and degree programme outlines.
- No department has an academic advisory service on line.
- No mention is given on the outreach activities of departments and faculties.
- There are no pointers to other information sources provided by department.

Technical Issues

To find out Technical issues affecting ICT use, the Information Technology manager at the main administration, the systems analyst and the network engineer were asked to list, which was currently the priority area of the following: Training of users, Security, E-mail, Hacking, Cost, Growth, Use of facility for research, Response to queries.

The same group was also asked to list out of the following which preoccupies their staff's time i.e. Web support, help line, training, network support, student support, e-learning, administration and planning and finally repairs. The results of the prioritisation are shown in the tables 7 and 8 below.

Table 7**Technical issues on ICT use**

Issues	IT Manager Admin ranking	Network Technical Support/ Analysts ranking	Network Engineer ranking
Use of Bandwidth	9	6	N/A
Capacity of bandwidth	8	11	5
Use of facility for Research	10	8	2
Hacking	5	4	9
Security	4	2	1
Cost	6	12	7
Growth	7	10	6
Legal Matters	N/A	9	10
Training of users	1	7	3
Response To queries	2	5	8
E-mail/WWW	3	1	4

Table 8**Items that preoccupy technical staff time**

Item	IT Manager Admin ranking	Network Technical Support/ Analysts ranking	Network Engineer ranking
Web Support	N/A	4	7
Help line	3	3	3
Training	2	5	6
Network support	5	1	2
Student Support	N/A	6	4
E-learning	N/A	7	8
Admin/Planning	1	8	5
Repairs	4	2	1

The following was noted from technical personnel i.e.:

- The user base is growing.
- There is a high usage of the infrastructure though use is inefficient.
- Users need more training and education on the available facilities on the network.
- Policies on ICT not enforced.
- More applications needed.
- Some attitudes are not moving with the times.
- Users are pulled instead of them pushing for more services.
- The service was greater in the Engineering and Science Faculties. This is

so because traditionally these faculties run courses that require computer skills.

- Repairs, help line and network support seem to occupy staff time in most instances. Training despite being an important item in table 6, it does not occupy as much time in the day-to-day activities.

E-mail/www and security are the only issues on which some of the three technical personnel share concern.

Interpretation of Findings

From the presented data most critical issues to effective use of ICT such as policy, budget and training are not adequately addressed. 65% of the responses to these critical items were negative in table 1 and 2 respectively. A possible explanation for this is the relationship between policy and effective use i.e. policy supports usage trends. Budget absence can be explained by the poor macro economic environment, which has reduced the overall university-funding base. However alternative funding sources could be used. ICT resources are inadequate and the distribution of the available resources is not transparent hence the view that resource allocation is not equitable. ICT services are slowly being appreciated, hopefully with more training this should increase.

With more departments having no training programmes support staff are needed to make ICT use effective especially for student training purposes. The use of e-mail is now part and parcel of communication process; it is also necessary to introduce other forms such as file transfer protocol for voluminous documents. Electronic-forms and other tools are being used to facilitate effective administration.

It is pleasing to note that almost every one of the teaching staff interviewed can use email and can access and use the Internet. A majority of them can also relate ICT to teaching and learning as most now accept Internet referenced material. However problems relating to the use of multimedia presentations and the need to keep a database as the skills are weak in the sampled group. There was equal probability of 0.33 for having a response with skilled, working knowledge and unskilled making 66% of sample computer literate.

Students need more support through training and making resources available. The literacy level was not encouraging. There are few department based computer laboratories where students can work. The library is congested most of the time.

The department website is a window to the greater world and one hopes what we place on the website offers the world a picture of what we are doing. A possible explanation for the poor content and information placed on the website is no one in the department or faculty is directly responsible for the website, and that the power of the websites is not yet appreciated. More current and useful information needs to be placed on the websites.

Technical staff feel that use of the infrastructure and services is very low, hence the need for more information on the available services. Repairs and help line preoccupies the time of technical staff. Perhaps with extra training repairs will come down.

The services provided by ICT should improve productivity and motivate staff by making work exciting. Given that these developments are coming within a short space of time, the university is doing fairly very well, there is need to consolidate current efforts and benefit from ICT.

Conclusions and recommendations

The study set to find out what was happening regarding the use of ICT for administration work and for Teaching and Learning activities. The following is a summary of the study's findings.

- a) At department level no policies or strategies exist on the use of ICT either as a teaching and learning tool or as an administrative tool. This is reflected in the way ICT use is applied in departments and for teaching and learning purposes. The probabilities on tables 1 and 2 matched indicating that the absence of policy results in poor support for ICT users in the three main areas of budget, training and resource availability.
- b) The study established that a high number of teaching staff is computer literate. However this has not been at the initiative of departments but at personal level. Almost all teaching staff can use the e-mail and Internet with an average literacy level of 66%. It is important though to provide training in the use of databases and multimedia facilities for the teaching staff as their skills in this area are weak as shown in the study.
- c) Equipment is not adequate for the students and staff alike. It is however more strikingly inadequate for the students as they have to queue for access at the Library where the computers are very few. All chairpersons echoed this.
- d) Students need more support to gain ICT skills. The poor literacy of students was as a result of lack of training. Few of the sampled departments had any programme for student training.
- e) Budgeting for ICT is not regarded as an issue as no department had a meaningful budget for ICT development.
- f) E-mailing is very popular among users of ICT as almost all the participants in the study indicated their reliance on its use.
- g) No ICT teaching and learning programs exist in the sampled departments. And
- h) Website information is not very helpful, as it is general, is not updated and at times outdated. One site talks of an advertised upcoming event is for 1999.

These worthwhile and interesting findings have been made and from them the following conclusions were drawn.

Conclusions

These conclusions are based on the research done and are related to the sub-questions posed earlier on. Other issues were noted also during the research, which may require further study, and these will be mentioned along the way.

- Policy on Information and Communication Technology at department and faculty level is not present, weak or not actively pursued.
- Training of staff and students is not formalised hence the poor literacy rate of many students.
- Using Information and communication Technology for teaching and

- learning purposes is not yet implemented in many teaching departments.
- E-mail is very popular with administrators, staff and students.
- Departments and faculty generated information available on the Intranet is not substantial and that which is found is rarely updated.
- Teaching staff is keen to use ICT as a teaching tool if training is provided.
- It is probable that 66% of teaching staff are have computer skills of one kind or the other, while it is also probable that 45% of students are computer literate.

Given the above conclusion, the following recommendations are suggested to reverse some undesired findings and strengthen positive use activities of ICT services.

Recommendations

Within the department/faculty board there is need to appoint a computing/ICT co-ordinators or committees responsible for the following:

- Enhancing and championing the profile of ICT
- Managing and updating the department/faculty website
- Liase with computer centre, library and Information Office on ICT related matters
- Spearhead E-learning initiatives
- Disseminate to members new developments
- Identify and ensure that staff training needs are met
- Identify needed resources
- Ensure that good practices are adhered to and
- Identify good practices within and outside the university useful to department.

As part of University curriculum there is need to include Information and Communication Technology component particularly word processing, Internet and e-mail use. This will at least enable every student to be computer literate and function independently. Administrative support is needed for those able to provide Internet-only teaching.

Strategies should be sought that ensure that the ICT infrastructure is self-financing by including commercial services to the services on offer. Life cycles of ICT are getting shorter and this requires that the planning cycles should also get short. To further reduce administrative costs users should be regularly updated on new ICT based communication procedures.

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