RESEARCH ARTICLE

ICT AVAILABILITY, ACCESSIBILITY, USE AND TRAINING NEEDS OF WOMEN AT MOI UNIVERSITY, KENYA

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ARTICLE INFO	ABSTRACT
	This paper is based on a study that investigated the use of ICTs by women in public universities in Kenya with a focus on Moi University. It discusses the ICT resources available in Moi University, the level of development and use by the general university population and the extent to which women use them. The study adopted survey design and focused on the staff, both teaching and non-teaching, and students. Out of 2,200 participants, 160 respondents were randomly sampled for the study. Data collection was by face-to-face interviews and questionnaires. The data obtained was analysed using descriptive and inferential statistical techniques. It was found that various ICT resources existed in the University and most of the women in the University have access to these resources despite various challenges. However, it was found that women, especially the younger generation are proactive towards ICT. The study recommended to the University authorities to provide training opportunities for women to better equip them in the use of ICT resources; more ICT resources be availed to increase opportunities for use by women while also designing and implementing complementary institutional changes to facilitate women's access to and use of ICT resources.

INTRODUCTION

The last 40 years have seen a worldwide spread and evolution of Information and Communication Technology (ICT) and in the 21st century, the world is appropriately called an 'information society'. There is more information now than ever before in human history. It is in this period that new industries have emerged, new social structures defined, and new job responsibilities created. All these have dictated people's responses to the presence of ICT. The effects of the new technology are profound and have been felt far and wide, even within the public universities in Kenya. Marcelle (2000) defines ICT as a collection of goods and services used for producing, distributing, processing and transforming information. Included in this set is the output of industries as diverse as telecommunications, television and radio broadcasting, computer hardware and software, computer services and electronic media (e.g. Internet, electronic mail, electronic commerce, and computer games). Further to this definition, the International Telecommunications Union includes digital communications, specifically satellites, mobile telephones, wireless local loops; speech recognition technologies, computer–assisted distance learning, and global positioning systems (International Telecommunications Union, 2002a). The rapid infusion and diffusion of ICT into public universities in Kenya has raised important challenges for both students and staff in these institutions of higher learning. The challenges are especially heavy for the female members of the university community, as ICT usage has come with new demands for training job competencies and management issues.

In Moi University, most schools have adopted ICTs in their work operations. Many departments now offer training in the use of ICT at varying levels. Most of them offer basic introductory courses while a few departments offer entire degree programmes at a more advanced level. Schools, e.g. Information Sciences, have a Departments of IT in which students can specialise in IT studies at undergraduate level. The researcher, being an insider, is aware that with availability of trained staff, plans are underway to offer Masters Degree in the same field. In the School of Engineering, several courses in computer studies, both basic and advanced, are offered while in Chepkoilel Campus, the School of Science offers an undergraduate programme, BSc. in Computer Science.

In the offices, virtually every office now has computers and other ICT resources, which include e-mail services, printers, fax machines and network connections. These resources are used for both information management and communication. In these offices, the users of the ICT include both men and women. However, according to studies conducted, especially in the developed countries, men generally tend to use ICT more than women. According to Panteli *et al.* (1999), in studies conducted in Europe, the numbers of women in the ICT sector in the 1990s was rated as fluctuating between 19%

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and 22% as a proportion of the whole population. Further studies have also shown that women tend to shy away from ICT and related professions during their early years of education.

In Africa, this issue has received a lot of attention in the recent past as more and more women get better education and wish to voice the plight of their less fortunate sisters. Unfortunately, in spite of their concerted effort to improve the situation, one thing remains constant: the performance of girls in national examinations is generally below par, and they continue to lag behind boys, especially in the subjects that offer a direct path to lucrative professions such as architecture, engineering, medicine and pharmacy. These key subjects include Mathematics, Physics, Biology and Chemistry. Low performance in these areas could be a result of few female role models and inadequate opportunities for girls to concentrate on their studies. This is especially true for girls in rural areas whose education is the first casualty when there is no money for school fees. They are also expected to participate in routine household and garden chores as opposed to the boys, leaving them little time to study. In the long run, they end up doing poorly in class and especially in the Science and Mathematics areas, which require more time and effort to perfect.

Quaisie (1996) says that there is a gender bias in attitudes towards women studying or using information technology. Throughout the world, there are problems in attracting young women to science and technology studies. The problem is worse in Africa than in any other region. Many (predominantly male) Maths and Science teachers in Africa hold outmoded views that girls 'can't think or work scientifically' and that science is 'too mechanical and technical for girls', thus discouraging female students. According to Rathgeber (1995), at tertiary level in Africa, young girls make up only 2.1 and 1.6 percent of engineering students in Ghana and Kenya respectively, (although this has increased in the recent past). In some Pacific countries (especially those of Melanesia), traditional cultural attitudes discriminate against women having access to education and technology. Girls are encouraged to take any job or get married rather than seek higher education. The alternative of doing two (or three) things at the same time is not realistically entertained (Commonwealth of Learning, 2001). Attitudes that information technology is not for women are not limited to formal education. In an Information Technology Development Group (ITDG) project for rural farmers in Cajamarca, Peru, when women undertook information technology training with men, the men mocked them, saying that computers were for men, not women's (Puican, 2002).

Sometimes, collateral cultural factors - other cultural attitudes based on gender bias, rather than the immediate gender identification of technology use – prevent young girls and women from accessing and using ICTs. In Uganda, girls did not get access to the limited number of computers installed in school (under a WorldLinks Programme) because of the socio-cultural norm that 'girls do not run'. As a result, boys ran and got to the computers first and refused to give them up to girls. The earlier curfew hours for girls at boarding schools can further constrain their access (Gadio, 2001). Hafkin, (2002) says that gender analysis of life in the information society reveal that women significantly lag behind men in their access

to, use of and production of ICTs. The rural areas of the developing world are caught on the wrong side of the digital divide and women, who make up the majority of the population in rural African, Caribbean and Pacific countries, are likely to be farthest removed from digital opportunities. She further reckons that there is a gender bias in ICTs which occurs not only at the local level but also in national and international settings where women leaders are not being given the opportunity to play an active role in developing the ICT sector and ensuring its relevance to development. The study, therefore, sought to discover the levels of use by women, both students and staff, of ICT resources in Moi University and the challenges they face with a view to suggesting strategies that would enable women to embrace ICT, not only as a necessary tool for communication but also as a tool that will improve their efficiency and effectiveness at their workplaces.

Critical Issues on ICT Use by Women

Generally, the Information age has been characterised by a wider male than female participation. In Kenya, and in Africa as a whole, the number of women compared to the number of men in the ICT sector is still very low. The possible reasons for the limited use of ICT resources by women may be due to inadequate training, negative attitudes towards ICT in general and the dynamic nature of ICTs that signifies frequent changes and new developments. All these require acquisition of new knowledge and skills for individuals to be able to cope. Wilson (2003) observes that women's alienation from technology is a product of the historical and cultural construction of technology as masculine.

Women have generally tended to lag behind in the so-called "challenging" fields of Science and Technology and Mathematics from which ICT as a field borrows heavily. Various authors have written on the gender imbalance that is evident in education in general and in these fields of knowledge in particular. Hafkin (2002) says that there is a gender bias in ICT, which is especially strong in rural areas of developing countries. This is evidenced by fewer women in science and technology and attitudes that information technology is 'not for women'. Kenya is no exception and it is against this background that this study was undertaken. The study investigated the extent to which women in Kenyan Public universities, using Moi University as a case, have embraced ICT in their environment. It is evident that the effects of poor performance early in life and the negative attitudes to science subjects gathered along the way have an effect on women's performance with ICT later in life. These and other factors could be verified through a study of the women themselves and how they make use of ICT resources in their day-to-day work operations and communication issues. The purpose of the study was to find out the levels of computer literacy and use of ICTs among female workers and students at Moi University. It also examined women's attitudes towards ICT in general and the extent to which they appreciate modern technology. The challenges and barriers facing them in the use of ICT were also examined.

Growth in ICTs

Despite the very rapid diffusion rates, the pace at which geographic expansion of the ICT sector has taken place is still

very slow. As a result, much of the growth in ICT markets comes from developed countries. Figures for distribution of Internet hosts show that in July 1999, North America and Canada accounted for 65.3% followed by Europe at 22.4%, trailed by Australia, New Zealand and Japan at 6.4%. All other countries accounted for only 5.9% of Internet hosts. While these figures are only for one ICT application, it is indicative of the broader trend for concentration of the so-called global information society in the wealthy countries of the world (Marcelle, 2000).

Table 1: Indicators of ICT Availability

Level of Human Development	High	Medium	Low
Telephones per 1000 people	502	54	4
Televisions per 1000 people	595	182	36
Personal Computers per 1000 people	205	7.2	Data not available
Internet Hosts per 1000 people	34.5	0.24	Negligible

Source: *Adapted from Marcelle (2000)*

The table above maps levels of human development against differences in availability of ICTs. The above data confirms that diffusion rates have been slower in developing countries where levels of human development are low.

ICTs: Virtuous or Vicious Cycle?

Marcelle (2000) describes the virtuous/vicious cycle of ICT implementation. She asserts that in economies where the following conditions exist, rapid diffusion of ICTs facilitates human development and produces material benefits: She explains that on the one hand, the Virtuous Cycle consists of:

- Facilitating innovation climate and institutions
- Economy driven by the services sector
- Supply of skills and finance
- Disposable income and investment capital
- Risk capital
- Policy intervention

However,on the other hand, she points out that in many more countries, the following conditions exist and there is the vicious cycle of change characterised by:

- Absence of innovation participating in ICTs as consumers only
- ICTs poorly integrated with the rest of the economy and society
- Lack of skilled people and finance
- Low levels of income
- Insufficient policy capability

The Wealth Divide

The rapid diffusion of ICTs is a socially embedded process that has taken place in conjunction with other broad changes in social, political and economic structure. Therefore, the effects of rapid diffusion of ICTs are not isolated or determined by changes in the technology, but should be understood within a specific, structural and institutional context. In the last decade of the 20th century, the process of globalisation has significantly altered the nature of economic, political and cultural relations among nations, economies and people. It is now widely accepted that the changes inherent in this process are not unequivocally positive. Just as

globalisation has produced winners and losers, depending on the positioning of groups and individuals vis-à-vis this complex set of changes, so has rapid diffusion of ICTs (Marcelle, 2000).

Henry (n.d) notes that in general, the wealthy people are seen as the ones who can afford to purchase the technology and acquire the skills necessary to use it while the poor are restricted by barriers such as poverty and illiteracy. Kenny in Henry (n.d) indicates that "Low income countries account for 40 percent of the World's population and 11 percent of its gross national income. Yet, of 242 million Internet users worldwide in 1999, only 5 million, or about two percent, were in low-income countries. Of 110,498 secure servers worldwide, that use encryption technologies in Internet transactions (commonly used for e-commerce), only 224, or 0.2 percent, are in low income countries".

The positive benefits of diffusion of ICTs vis-à-vis productivity gains, job creation, improvements in wealth, enhancement of well being, are for the most part, limited to the wealthy countries. In those countries, the rapid diffusion of ICTs has been facilitated by technological innovation, economic restructuring in OECD countries, re-organisation of firm-level production processes, changes in functioning of markets and social political change and through a series of feedback effects, has produced material and social gains. Policy makers, especially in the developed countries, have been actively promoting growth of the ICT sector and seeking to maximise the positive benefits of ICTs. Increasingly, their attention is turning to managing the negative social consequences of the use of ICTs and ensuring that there is equity in access and distribution, e.g. European policy makers have sought to understand how ICT development can produce social consequences that are undesirable and can reinforce existing social iniquities and to produce guidelines for ameliorating these negative effects (High Level Group of Experts, 1997). In developing countries, however, policy makers lack the capability to make the use of sophisticated interventions necessary to promote and manage the rapid growth of ICT sector and face the burden of uneven pace of development and few degrees of freedom. This is largely a result of poor infrastructure, lack of relevant policies, widespread political unrest and rampant poverty in these countries.

ICT and Women

In spite of the increasing availability and use of ICT the world over, the continuing trend is that women are still at the tail end of users and designers of the technology. According to Panteli in Wilson (2003), women are under-represented in Information and Communication Technology jobs in all member states of the European Union. Recent evidence shows that just 12% of full-time undergraduates on British computing science courses were women. A similar situation exists in the USA where the percentage of Bachelor's Degrees awarded in computer science to women has decreased almost every year over the last decade. She further observes that women in computing tend to be segregated. They are found to be working in what are considered as 'softer' areas of the profession, for example in sales, marketing and support functions, such as customer services and on help desks, jobs

seen as requiring good interpersonal skills. Men dominate technical jobs, like analyst and programming jobs. Research in Silicon Valley, U.S.A. found numerous examples of women being assigned menial tasks, while similarly male colleagues are given 'choice' projects. Jobs are also segregated hierarchically so women have a small proportion of management posts and earn lower salaries. As a result, computing continues to attract mainly men.

Wilson (2003) observes that women's alienation from technology is a product of the historical and cultural construction of technology as masculine. The continued male dominance is due in a large measure to the enduring symbolic association of masculinity and technology, cultural images and representations of technology converging with prevailing images of masculinity and power. The computing culture, particularly the cultural image of the computer, is not attractive to women. She further states that in the computing profession, the personal qualities thought to be required for computing scientists are those usually associated with men – hard headedness, single-mindedness, ambition, and toughness. Among the obstacles preventing women from fully participating in computing career are family commitments. Computing is seen as a career that demands long hours and is constantly evolving, making it difficult for women to take time out, especially those with young children. Another explanation for female's lack of enthusiasm with computers is the attitudes of parents and teachers who believe that computers are learning tools predominantly for males. The ratio of computers to pupils/students in schools and colleges, the location of computing in science and mathematics classes and the emphasis on experience gained in computer clubs, all have benefited boys rather than girls.

Observation of the local scene reveals that much of what happens in the developed world also happens here, albeit on a larger scale. Girls are disadvantaged in several ways right from basic education to training opportunities for further education. In the process, they develop negative attitudes towards technology, viewing it as men's only field. Societal factors, such as few role models, and prejudice against women, also hamper women's advancement in technical fields. Women are also alienated when it comes to leadership and decision-making positions in organisations. All these factors hinder them from being prepared adequately for participation in the field of ICT and related professions. According to Crawford and Macleod in Wilson (2003), female teachers can create a participatory climate for all students. When women students are introduced to computers such that they are presented as non-threatening, not linked with mathematics and as instrumentally useful, motivation and interest in computers increases markedly. Conscious re-design of courses to attract those interested in the social and organisation aspects of technology is likely to increase the percentage of female students. Women university students will be more attracted to computer courses that emphasise social issues and computer applications than to traditional science-based computer courses.

Information Systems and Educational Impact

Fulmer (1995) argues that the potential of Information Systems will be maximised when the capacity of the technological architecture and system design are capable of affecting the learning and teaching process or technical core of educational organisations. Much has been written about statistical process controls and productivity in manufacturing facilities, but little has been done about information systems impacting productivity in educational settings. A shift in focus is required from the management of information to the support of the work of the technical core, teaching and learning. Barta, Telem and Gev (1995) note that there is a rapid computerisation process strived after and taking place in schools in many of the developed countries where school management information systems (MIS) are being designed and implemented to provide educational administrators with new tools to support them in a variety of activities, e.g. grade and attendance reporting, placement in classes, teachers' allocation of classes, construction of school timetables and examination schedules, among others. Concurrently, automated office tools, e.g. electronic mail, electronic archives, spreadsheets, desktop publishing are rapidly becoming routine. The use of these new technologies is, however, more common in the developed world than in the developing countries where most, if not all, teaching, learning and administrative duties are still undertaken using traditional methods, i.e. formal classroom sessions, chalk-and-board delivery, among other methods.

MATERIALS AND METHODS

The study was a formal survey research that was done to identify, describe, analyse and interpret the existing situation on the existence of ICT resources and their use by women in the study area. It was carried out in the Main Campus of Moi University. The respondents were women, both staff and students, of the various departments and schools at the Campus. The total female population of the Campus was approximately 2200. Out of these, a sample of 160 was selected. The sample was obtained by use of the stratified random sampling where the population was divided into two, i.e. students and staff. Out of these two groups, 119 of the respondents were students while 41 were staff members. The method of data collection was by interrogation or communication with the respondents. Data was collected using both interviews and questionnaire. Some of the data that was collected (specifically from the questionnaires) was quantitative in nature, and these were analysed accordingly. Interview responses were mainly qualitative and these too were analysed accordingly.

RESULTS AND DISCUSSION

Characteristics of the Female Population at Moi University, Main Campus

An overview of the characteristics of members of the female population at the University was obtained by seeking information on position (either student or staff), age, and marital status. Table 2 below presents the total number of female staff and student respondents, with these numbers expressed as percentages of the total. The study revealed that 93.8% of the respondents were female students. Out of the total 128 respondents who answered by questionnaire, 8 were members of staff and this formed 6.3% of the total. Based on age, 20.8% of the respondents were aged below 20 years; 68.5% were between 21-25 years; 3.1% were between 26-31

years, and 4.6% were between 31-36 years. Another 3.1% were aged over 36 years. Most of the student respondents were in the undergraduate level (98.5%) with the remaining 1.5% being post-graduate students.

	No. of Respondents	Percentage Of total
Position		
Students	120	93.8
Staff	8	6.3
Total	128	100
Age		
Under 20	25	19.5
21-25 yrs	88	68.8
26-30 yrs	4	3.1
31-35 yrs	4	3.1
Over 36 yrs	4	3.1
Missing	3	2.3
Total	128	100
Marital status		
Single	113	88.3
Married	13	10.2
Divorced	1	0.8
Widow	1	0.8
Total	128	100

Most of the respondents were single (88.3%), while 10.2% were married. Out of the total number of respondents, 0.8% had secondary school as their highest level of education while 2.3% had attained tertiary or other training college level. A further 96.9% either had attained a university education or were pursuing courses in the University.

Availability of Computers in Departments

Upon being interviewed, 74% of the respondents said that they had computers in their Departments or Schools, while 26% of them said that they did not have computers in their Departments. This is reflected in the pie chart in Figure 1 below.
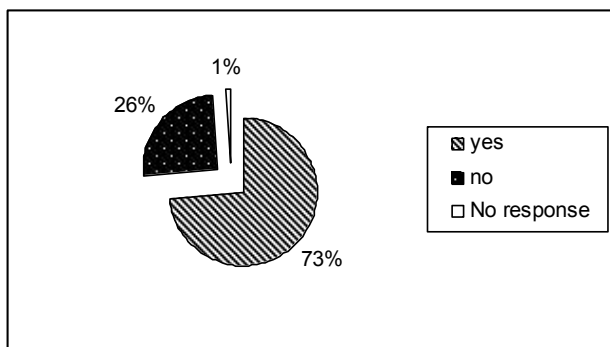

Figure 1: Response to the question: 'Do you have computers in your department?'

Upon cross-tabulation of the responses, it emerged that 100% of the respondents from the Schools of Information Sciences, Business and Management, Environmental Studies and Engineering replied that they had computers in their Schools. On the other hand, 71.4% of the respondents from the School of Social Cultural Studies, 42.5% from the School of Education, and 66.7% from the School of Law said they had computers. Their responses are shown in the table below.

The indication from Table 3 is that respondents from Environmental Studies, Business Management, Information Sciences and Engineering were most likely to have computers, followed by Social Cultural, Law and Education who were least likely to have access to computers.

Table 3: Response about Having Computers by School/Department

			Env. Studies	Soc. cultral studies	Busin ess & mngt	Infor scienc e	Educ.	Eng.	Law	Total
Have compu ters in dept	Yes	Count	1	15	22	23	17	4	10	92
		% within School/departme nt	100.00	71.43	100.00	100.00	42.50	100.00	66.67	73.02
		% of Total	0.79	11.90	17.46	18.25	13.49	3.17	7.94	73.02
	No	Count	0	6	0	0	22	0	5	33
		% within School/departme nt	0	28.57	0.00	0.00	55.00	0.00	33.33	26.19
		% of Total	0	4.76	0.00	0.00	17.46	0.00	3.97	26.19
Tota l		Count	1	21	22	23	40	4	15	126
		% within School/departme nt	100	100	100	100	100	100	100	100
		% of Total	0.79	16.67	17.46	18.25	31.75	3.17	11.90	100.00

For those who said they had computers in their Schools or Departments, 30% said these computers were for use by staff only, 3% said they were for use by students only, while 38% said they were for use by both students and staff. A small percentage (3%) said that only members of special projects could use the computers available in their Departments. These responses are shown in the chart below.
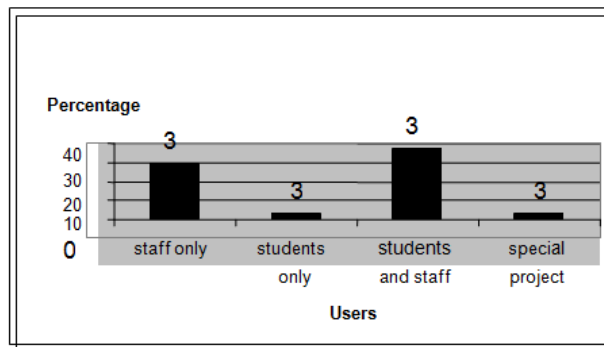

Figure 2: Access to Computers by Different Users

Attitude towards Information and Communication Technologies

In response to the statement 'Computers make me feel nervous', 74% disagreed with it while 10% were undecided. A further 16% were in agreement with the statement. These responses are captured in the pie chart in Figure 3 below. On the issue of whether or not women are more afraid of computers than men, 82.8% disagreed with this statement while 11.7% were in agreement. When asked whether or not they thought that men could do better at ICT than women, 85.2% said this was not true while 10.2% agreed that men were better at ICT than women. These sentiments contradict what most published authors have said as the trend, that most women are afraid of computers and have the attitude that men are better at computing than women. They are a direct

reflection of the changing trends as a result of permeation of the technology such that ICT, in one form or another is becoming more and more common in many parts of Kenya. Figure 4 below shows the respondents' rating of their view on ICT, whereby 80% view ICT as being easy and enjoyable, 11% were undecided as to their view while a further 9% found it difficult.
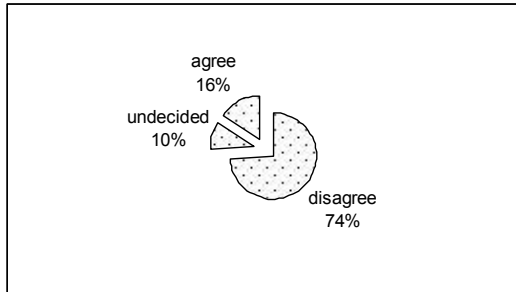

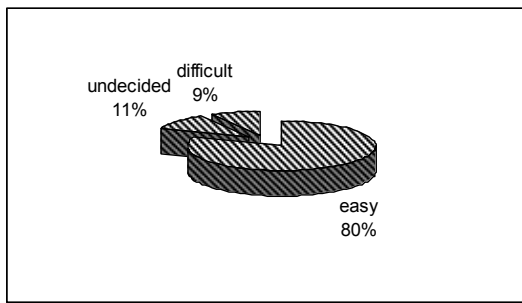**Figure 3: Response on "Computers make me feel nervous"**

Figure 4: View on Level of Difficulty of ICT

When asked whether or not they would like to receive more training in usage of ICTs, 97.7% of the respondents said they would like that while only 2.3% said no. These responses are shown in Table 4 below. The likely reason for these responses is that women are getting more interested in these technologies and thus would like to be more competent in their use. One of the important ways of acquiring this knowledge is by attending formal training sessions which may be within the university environment or in other training institutions outside the university.

Table 4: Response to the question 'Would you like more exposure in computer training?'

		Frequency	Percent	Valid Percent	Cumulative Percent
More exposure	Yes	125	97.7	97.7	97.7
	No	3	2.3	2.3	100.0
	Total	128	100.0	100.0	

Table 5 below shows the specific areas of ICT usage that respondents indicated they would like more training on. A large percentage of the respondents, 96(75%), indicated they would like to be more knowledgeable in Programming while 76(59.38%) said they would like more training on how to use the Internet. On the other hand, a relatively small number indicated interest in the more specialised areas of ICT, such as Management Information Systems (1.56%), Networking

(3.91%), Web designing (4.69%) and Computer Accounting Packages (1.56%). This could be due to limited exposure to these specialised areas due to non-usage in their day to day work or study activities. Probably, if these women had to use these specialised ICT softwares, they would be more knowledgeable.

Table 5: Areas of Interest for Further Training in ICT

Area of Interest	Frequency (n= 128)	Percentage (x/128) * 100
PowerPoint	61	47.66
Spreadsheets	50	39.06
Word Processing	65	50.78
Databases	71	55.47
Programming	96	75.00
Internet	76	59.38
Computer Accounting packages	2	1.56
Networking	5	3.91
Management Information Systems	2	1.56
ARC-GIS	1	0.78
Web-Designing	6	4.69
M.C.S.E	1	0.78

What are some of the ICT Resources that exist in the University today?

The ICT resources found in the University today include computer hardware and software, communication services including the Internet and electronic mail and entertainment media such as computer games of different kinds. A few of the computer hardware are connected in local area networks using such media as fibre optic and coaxial cables. The VSAT (Very Small Aperture Terminal) technology has also been applied to link the main campus and the Health Science School and the Chepkoilel Campus located several kilometres away from the main campus. Mobile telephony is also widespread in the university with most people now owning a personal mobile phone.

What do you Use ICT for in your Work?

The women interviewed all had varied uses of the ICT resources. All the respondents (100%) said they owned mobile phones which they used to communicate for both personal and work related issues. Seven of the respondents (70%) said they used Word Processing software to prepare their documents which were either reports for meetings or class notes for teaching. Out of the 10 interviewees, 6 of them (60%) said they were directly accessible to the Internet at their workplaces and were therefore able to communicate with people both within and outside the university compound. However, 3 interviewees said they had no direct access to the Internet in their offices but can access it at other points in within the university, such as the Margaret Thatcher Library. They use it for communication and to search for information on the World Wide Web.

In your Opinion how would Use of ICT improve your Performance at Work?

All the respondents (100%) agreed that the use of ICT would improve their performance at work. They felt that they would be able to do more and better work in a shorter time as

opposed to using manual methods, e.g. handwriting notes or using manual typewriters to write reports. Use of ICT would also improve communication between colleagues at work such that delays in message transmission and undelivered messages would be a thing of the past.

What Changes would be needed to Encourage Women to make Use of ICT more than they do?

Some of the methods that were suggested for encouraging women to make more use of ICT were that they needed more training opportunities to equip them to use the existing and upcoming ICT resources of various kinds. To do this, workshops and seminars on this topic should be held frequently and should target staff at all levels, especially in the middle and lower levels where a lot of these women are likely to be. When scholarships and other funding are available, women should be considered for these, to take advantage of training opportunities in ICT. Another suggestion was to adapt affirmative action in employment policies such that more chances are given to qualified women to hold significant positions in ICT and related areas. These women will act as role models for upcoming students and staff, who can emulate their example. They will be confident to know that other women have made it and continue to perform well in this male-dominated area of ICT.

CONCLUSIONS

It was established that various ICT resources existed in the University. These include various hardware and software facilities that are available in the different departments, schools and Schools of the university. Hardware devices include computers, facsimile machines, networks, both local and wide area, multimedia devices, telephone linkages, among others. Software resources also exist to ensure the hardware can be utilized and include word processors, desktop publishing software, and communication software, e.g. e-mail programs, among others. It was realized that all departments have computers albeit in different numbers. The uses of these computers varied in the different departments with majority of the existing hardware being used by both students and staff. This shows that the University policy makers and administrators have realized the importance of these resources and have gone to great lengths to avail them in the different Schools and Departments for students and staff to make use of. It was established that well over 90% of the women in the University have access to these ICT resources, mostly the computers. In most Departments and/or Schools, both students and staff can make use of these resources. In a few cases, however, use of these resources was limited to staff only or to members of special projects. Most Schools are, however, yet to organize formal computer laboratories with enough ICT resources for use by the members. This was especially evident in the Art-based Schools and Departments, e.g. the School of Education, where only 42.5% of the respondents said they had computers. This could be compared to the respondents from a School such as Information Sciences, where 100% of the respondents said they had access to computers. In the School of Information Sciences, there are formally organized laboratories where students and staff have access to computers which used for their daily academic activities. In the Schools where there are no laboratories, people have to request the

members of staff, especially the secretaries, to either assist them to do work or go to other Schools where laboratories exist so that they can use the computers there. Women do appreciate the advantages of being knowledgeable about ICT and using it in their day-to-day activities. However, most of the women confirmed that they were less knowledgeable in the more technical areas of ICT use, such as programming, database management, among others. Furthermore, they indicated that they were interested in acquiring knowledge and/or more training so as to be more competent in these areas. Out of all the respondents, 75% of them indicated they would be interested in acquiring knowledge in Programming, while 55.47% of them said they would be interested in knowing more about Databases and Database Management. However, for the more technical area of Networking, only 3.91% of the respondents indicated an interest for more training. It was therefore noted that most of the women tended to prefer the general application side of ICT (areas such as PowerPoint, word processing, and spreadsheets) as opposed to more technical and specialized areas, such as Networking, Web design and Management Information Systems. In this study, it was found that there were both similarities and differences in findings with past studies. The similarities were that still, few women are to be found in ICT related professions as compared to the men. It was found, for example, that most of the IT laboratory technicians are men, while most women involved with ICT mostly use the more general ICT software such as Word Processors in their day-to-day work related activities. These could also be said to be the softer areas of ICT that do not require any specialized skills to accomplish a given task. Bias to women in ICT is still evident with some women, especially the older generation viewing themselves as more incompetent in ICT usage as compared to the men. On the other hand, it was realized that many of the women, especially the younger ones, have a positive attitude towards ICT and do not necessarily view it as a man's world. They showed particular interest in ICT saying they used it and would like more training on it, not only on the 'softer' areas, but also on more technical areas such as Programming, Databases and Database Management. It can therefore be seen that with the passing of time, women are slowly taking an active interest in ICT and, rather than taking a back seat, are trying to be more and more knowledgeable in the various areas of ICT. Most of the women interviewed disagreed with the statement that 'women are more afraid of computers than men', (82.8%, compared with 11.7% who were in agreement). Generally, therefore, it can be said that women are slowly moving away from the traditional views and expectations of society that computers are not for women. They are identifying more and more with ICT and are getting more comfortable using the different ICT resources. In addition, they showed that they would like to be better trained and asked for more training to make them more competent in various areas of ICT usage.

RECOMMENDATIONS

The following are some of the recommendations that arise out of this study for the improvement in the use of ICT by women at Moi University.

1. Provide Training

Basic computer training should be made compulsory to all students irrespective of their areas of specialization. This will

help students appreciate ICT more and will equip them for use of ICT in their day-to-day activities and also for a better future in their workplaces. In addition, more training opportunities should be availed for staff members as well to keep them updated on the ICT developments and how these can be beneficial to them in their day to day lives in the workplace and elsewhere.

2. Avail more Computers

When students are required to scramble for the few computer resources available, women will obviously be disadvantaged due to sheer lack of physical strength. Women also tend to be less aggressive and will give up easily when they realise that they cannot compete with men to secure a computer for use. Thus, it is recommended that the University avail more computers to facilitate use of these resources by women.

3. Avail more Laboratories

The University administration should strive to set up and equip computer laboratories for all Schools irrespective of whether their core business is in ICT or not. This will enable more students and especially the women to have access to ICT and to improve on their skills. This is especially so considering the fact that ICT is permeating into all professional areas.

4. Offer Opportunities for Women to Work as ICT Professionals

More opportunities should be deliberately created for women to work as ICT professionals within the university. This will provide a positive challenge for them to participate more fully in ICT. It will also provide role models for the younger women who will appreciate that women are also able to perform well in this area. Women should be encouraged to personally interact with ICT at all levels whether basic or advanced.

5. Increase the Amount of time that Laboratories are open for Use

The available laboratories should be opened for longer hours than usual so that the users have more time to learn. This is considering that women, especially the married, usually have multiple roles and heavy domestic responsibilities meaning that the time available for improvement in use of ICTs is limited. Thus adaptation of schedules to suit women's hours would improve their access to and use of ICTs in the university.

6. Accompanying Institutional Changes

The development benefits of ICTs for women will be sustained if there are complementary institutional changes. Only through a process of institutional change can there be enabling policies for ICTs at local, national and international levels. These should target public and private investment in ICTs that benefit women and the strengthening of existing departments that promote improved gender access to ICTs. To this end, therefore, the University administration and any other policy makers would do well to design and implement policies that will improve women's access to and use of ICTs.

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