

# A COMPARATIVE ANALYSIS OF THE USE OF ELECTRONIC RESOURCES BY UNDERGRADUATE STUDENTS AT TWO KENYAN UNIVERSITIES

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## ABSTRACT

This article compares the information and communication technology (ICT) infrastructures, the levels of access, and the electronic resources usage patterns at two academic libraries in Kenya. The focus is on the use by undergraduate students at the private University of Eastern Africa, Baraton (UEAB) and the public Kenyatta University (KU) of electronic resources to support formal and informal learning. The article also briefly explores the perceptions of library managers with regard to teaching and learning. The data revealed that the UEAB had a higher level of ICT integration with formal and informal learning. The majority of the UEAB students had basic computer skills and the library had an adequate ICT infrastructure. On the other hand, KU appeared to be at an early stage of ICT integration, and had an inadequate ICT infrastructure. The article identifies specific difficulties, and recommends ways of improving the use of electronic resources at these academic libraries in Kenya, to support formal and informal learning.

## KEYWORDS

ICTs, ICT infrastructure, electronic resources, academic libraries, Kenya.

# 1 INTRODUCTION

Information and communication technologies (ICTs) are seen as general-purpose forms of technology with applicability across a broad range of uses (Ashcroft & Watts 2005; Katundu 2000; Ojedokun & Lumande 2005; Powell 2002; Stilwell 2007). The application and integration of ICTs may be varied, depending on the specific uses to which they are put. They are therefore regarded as being applicable to specific industrial and professional sectors, such as libraries, banking, healthcare, and education. Academic libraries have benefited from the application of ICTs in information storage and retrieval, and in that context potential skills requirements on the part of users include familiarity with computer packages, the ability to use internet resources such as e-mail and e-databases, and information retrieval skills such as the ability to conduct Boolean or keyword searches.

When first introduced into academic libraries, ICTs were applied to carry out functions such as cataloguing, the creation of online public access catalogues (OPACs), acquisitions, circulation, and processes such as digitisation (Levy et al 2003; Zainab, Abdullah & Anuar 2004). This focus limited their application to control by the librarians and to the accessing of information resources within one's own library. Today the use of ICTs in academic libraries focuses more strongly on the users, the infrastructure, and the skills that users should possess in order to benefit from access to unlimited information resources. The importance of ICTs therefore lies more in their ability to facilitate increased access to information and to promote wider communication. This article deals more specifically with ICT infrastructure, ICT competencies, and the use of electronic resources. ICT infrastructure applies to specific components, including PC workstations for students, intranets and the internet, computer application packages, and connectivity. ICT competencies refer to the students' basic skills in the use of computers and the internet for information retrieval.

Electronic resources, according to Hawthorne (2008), date back to the mid-1960s with the introduction of the machine readable catalogue (MARC), which was followed by online public access catalogues (OPACs). In the late 1960s bibliographic databases were developed, followed by CD-ROM databases in the late 1980s, online databases, and by web-based (internet) databases at the turn of the 21<sup>st</sup> century, which also saw the introduction of electronic serials and electronic books. In this development timeline of electronic resources, the internet is the most popular form of ICT available today, and it has made the greatest impact on access for library users worldwide (earlier electronic resources were limited to single-user access). The use of these internet-based electronic resources is examined in this article.

Statistics show that African countries lag behind those in the rest of the world in the development of ICT infrastructure (Katundu 2000; Ojedokun & Lumande 2005; Powell 2002; Stilwell 2007). If this is to be overcome, institutions must develop clear mission statements and policies that incorporate the support of ICT use. The value of strategic

planning has been articulated by Mutula (2001) and Ajayi (2002) as an important means of overcoming the challenges facing universities and their libraries.

The internet is the most commonly used ICT in academic libraries throughout the world. It is used to access information resources, specifically those that are web-based (Ball & Earl 2002; Burke 2008; Cullen et al 2004; Murgatroyd & Calvert 2006; Ojedokun & Lumande 2005; Ross & Sennyey 2008; Shuler 2007). If ICTs are to cross the threshold from promise to practice in academic libraries, then certain minimum conditions must be met. This demands a changed role for academic libraries if their hosting universities expect to become and remain internationally competitive. Universities and their libraries need to be re-organised for innovation. Such innovation is linked to the wider idea of knowledge networks in which educational issues such as the use of ICTs can be usefully considered.

## **2 ICT INFRASTRUCTURES IN ACADEMIC LIBRARIES**

There are many reasons why academic libraries should invest in ICTs. An environment in which library users are exposed to ICTs and are allowed to develop ICT skills is necessary (Ashcroft & Watts 2005; Poulter & McMenemy 2004; Zainab et al 2004). It is commendable that some developing countries, including Kenya, are making remarkable progress in ICT investment in academic libraries (Adogbeji & Akporhonor 2005; Mutula 2000; Mutula 2004; Odero-Musakali & Mutula 2007; Okiy 2005; Rosenberg 1998). Feather and Sturges (1998) state that such progress will enable developing countries to join the global information society (GIS), where the majority of people are engaged in creating, gathering, storing, processing and distributing information.

At universities, there are two modes of teaching and learning, namely the formal and the informal, both of which are characterised by a need for and the use of information. Academic libraries play an important role in connecting the two modes of learning (Burke 2008; Cullen et al 2004; Murgatroyd & Calvert 2006; Ojedokun & Lumande 2005; Shuler 2007). The primary obligation of academic libraries is to meet the information needs of institutional members. Information in the right quantities and of the right quality becomes a crucial ingredient for effective teaching and learning.

Academic libraries serve the important purpose of providing for the educational needs of students. Such needs arise either directly from the curriculum, or may be of a more general nature. ICTs, especially the internet, have had a great impact on general library operations (Adogbeji & Akporhonor 2005; Mutula 2004; Odero-Musakali & Mutula 2007; Okiy 2005; Rosenberg 1998). The application of ICTs in libraries represents the promise of barrier-free information access in which libraries will be at the hub of the information networks that provide access to information (Ahmed 2006; Francis 2008;

Manda 2005; Omona & Ikoja-Odongo 2006; Powell 2002; Sangowusi 2003; Selwyn 2008; Stoker 2000; Tise, Raju & Masango 2008; Torenli 2006).

The environment in which academic libraries, particularly in Kenya, find themselves at present requires them to articulate the importance of, and need for, ICTs. It also requires that they ascertain the degree and nature of the use of ICTs (Bernon 2008), more specifically the use of electronic resources.

### **3 USE OF ELECTRONIC RESOURCES IN ACADEMIC LIBRARIES IN KENYA**

Earlier studies on the use of electronic resources in academic libraries in Kenya, as well as in other countries in sub-Saharan Africa, have resulted in the identification of two important categories of barriers. The first category comprises physical barriers to the use of electronic resources (MacMillan 2009; Manda 2005; Mutula 2000; Mutula 2004; Odero-Musakali & Mutula 2007; Pritchard 2004; Rosenberg 1998; Selwyn 2008; Torenli 2006; Zainab et al 2004). These barriers include

- inadequate infrastructure networks such as intranets and the internet;
- lack of native-language content and software;
- power outages; and
- restricted access to ICT facilities, especially the internet.

The second category comprises personal barriers to the use of electronic resources (Ani, Atseye & Esin 2005; Ayoo & Otiike 2002; Feather & Sturges 1998; Francis 2008; Manda 2005; Odero-Musakali & Mutula 2007; Mutula 2000; Mutula 2004; Sangowusi 2003; Stoker 2000).

Personal barriers to the use of electronic resources are identified as users

- not knowing what information is needed or available;
- not knowing where to look, meaning that they may have a question or problem but do not know where to turn for help;
- not knowing what sources of information exist; many are pleasantly surprised when guided to existing resources by their librarians;
- lacking the confidence or technical skills required to use computers in the case of online information searching; and
- becoming discouraged by long delays when trying to access information resources, especially if the network connection is slow.

Against this background, the use of electronic resources in two university libraries in Kenya was examined and compared.

## 4 RESEARCH METHOD AND PROCEDURE

A broad qualitative approach was adopted, and the survey research design was selected because the study was primarily descriptive in that it sought to discover the behaviour and perceptions of the students and library managers. Two separate sets of questionnaires were distributed to two target groups, namely the third-year undergraduate students and the library managers at the University of Eastern Africa, Baraton (UEAB) and Kenyatta University (KU). The study applied data triangulation to determine internal validity in qualitative research (Meijer, Verloop & Beijaard 2002).

UEAB is a private institution, established in 1981 and chartered in 1991, and offering degree courses in the arts, sciences, humanities, business, education, health sciences, and technology. The university is situated 40 kilometres from the town of Eldoret in the Rift Valley province. The library building, which was completed in 1992, houses over 50 000 volumes and subscribes to 54 print journal titles.

KU is a public institution situated 16 kilometres from the city centre of Nairobi. KU received full university status in 1985 and has since established the faculties of education, arts, humanities, sciences, commerce, and information technology. The library complex was built in 1984, and can seat 415 readers. It houses 15 000 volumes and subscribes to 100 print journal titles.

The two university libraries were selected because of both the similarities and differences between them. Differences include

- *geographical location*: UEAB is rural based, while KU is urban based;
- *institutional sponsorship*: UEAB is private (church-supported), while KU is public (state-supported); and
- *student enrolment*: UEAB is small (fewer than 2 000 undergraduates), while KU is large (about 10 000 undergraduates).

The two institutions share the following similarities:

- Both are members of Kenya Educational Network (KENET), a body charged with the responsibility of providing ICT facilities, including the internet, to universities in Kenya;
- Both institutions offer a similar range of degree programmes; and
- Both institutions have been chartered by the government of Kenya.

The student population consisted of 250 third-year undergraduate students from UEAB, and 2 000 from KU. The third-year undergraduate students were selected because they represented a group of learners who had

- by that time received the necessary training in the use of library resources; and

- reached a level in their studies where they were engaged in academic research projects requiring the use of subject-specific information resources.

A sample size calculator was used to determine the correct sample size (Sample size calculator 2007). Using a confidence level of 95 per cent and confidence interval percentage of 50 per cent, the sample sizes were identified as 88 for UEAB and 328 for KU. The response rate for UEAB was 68.6 per cent, with 55 completed questionnaires returned out of the 88 distributed. The response rate for KU was 83.8 per cent, with 287 completed questionnaires returned out of the 328 distributed.

The second target group was the entire library manager population. Library managers were selected because

- they were professional librarians responsible for managing the library resources;
- they contributed to decision making with regard to the overall running of the libraries; and
- they participated in the development of the strategic (teaching and learning) plans of their university libraries. Their understanding of the student use of electronic resources was therefore critical for the improvement and consolidation of ICT integration at the two institutions.

All three of the UEAB library managers participated in the study, and at KU 21 of the 24 library managers participated, yielding response rates of 100 per cent and 87.5 per cent respectively.

The survey-generated data were analysed by comparing and evaluating variables such as computer skills, technical skills, library skills, and ICT infrastructures.

## **5 DISCUSSION**

The results are reported under the broad headings:

- Physical barriers to the use of electronic resources;
- Personal barriers to the use of electronic resources; and
- The role of the library in determining students' learning outcomes.

### **5.1 PHYSICAL BARRIERS TO THE USE OF ELECTRONIC RESOURCES**

The physical barriers identified in the study were related mainly to ICT infrastructure and the use of electronic resources at the two university libraries. An ICT infrastructure evolves and becomes more complex as the teaching and learning experience evolves. When implementing effective ICT infrastructure, decision makers should consider ICT

progression and ensure that it will support the learning experience of the students, hence improving learning outcomes.

Findings relating to ICT infrastructures indicated that the UEAB library made use of the very small aperture terminal (VSAT) facility, an initiative of the KENET project. The university had also purchased extra bandwidth to increase speed. The UEAB library had both an intranet and an OPAC, and there were four OPAC computers in the library. The traditional library services, including cataloguing and circulation, were all computerised. The UEAB library had an internet access room known as the Online Research Center (ORC), equipped with 25 online computers, for the use of undergraduate students. The ORC also housed the older-generation electronic resources, or CD-ROMs, popularly referred to as offline electronic resources. The CD-ROMs contained some important databases such as Wilson Full-Text, Ebscohost and ATLAS. There were three separate computers for CD-ROM access in the ORC. The library subscribes to some of the most important online electronic resources contained in databases such as AGORA, HINARI, Emerald, Cambridge University Press, and Ebscohost through the Program for Enhancing Research Information (PERI) initiative under the auspices of the Kenya Library and Information Services Consortium (KLISC). There were audiovisual materials, separately housed in the Audio Visual Center; the collection comprised DVDs, VHS tapes, audiocassettes and microfiche films for use by students.

However, the following problems relating to ICT infrastructures were identified:

- Frequent power outages on campus. This problem was not the fault of the university, but had serious repercussions for the LAN, often causing it to malfunction. Instances of power outages resulting in damage to computers in the library had been reported.
- Frequent periods of equipment downtime as a result of the power outages.
- The KU library had a VSAT facility, but there was no computer network in the library.

The OPAC had been in existence for two years and consisted of four stand-alone computers dedicated exclusively to the catalogue. The OPAC was updated periodically using CD-ROMs. The card catalogue was evidently still in use. There was a room in which audiovisual materials were housed and where students could access the internet and search CD-ROMs. Five online computers were available for internet access, and one was set aside specifically for CD-ROM access. Students were required to book 30-minute sessions. In addition, the library had a separate room equipped with two computers for use by postgraduate students, which provided access to the Database for African Theses and Dissertations (DATAD) project. Although these projects are in the library, access is restricted to faculty and postgraduate students. With regard to ICT infrastructure, the students commented as follows:

- The library needs to improve e-access services for students;

- The library needs to increase the number of computers for online services;
- The time allocated for access to online resources should be increased; and
- The technology level at KU had yet to meet the required standards, since most services were unavailable.

A number of administrative and policy issues were responsible for the state of ICTs at the KU library. These included

- lack of support for the library from the university administration, making it difficult to make any improvements to the existing ICT-based services;
- lack of clear policies supporting the development ICTs at the university in general; and
- lack of funds from the university for the library to improve the existing ICT services.

## 5.2 PERSONAL BARRIERS TO THE USE OF ELECTRONIC RESOURCES

Data revealed that there were personal barriers to the use of electronic resources at both the KU and the UEAB library. Personal barriers were related to the lack of

- technical skills;
- information retrieval skills;
- knowledge of existing resources and services; and
- students’ awareness of new e-resources in their academic libraries.

**Table 1: Students’ basic computer experience by gender**

	UEAB		KU	
	MALE	FEMALE	MALE	FEMALE
NO EXPERIENCE	--	--	4.9%	10.7%
NOVICE (little skill, basic options only)	48.4%	26.1%	42.3%	43.8
INTERMEDIATE (perform most tasks correctly)	25.0%	60.9%	44.8%	33.1%
EXPERT(use computers without any help)	26.6%	13.0%	8.0%	12.4%
TOTAL	100%	100%	100%	100%



The gender analysis of students' basic computer experience (see table 1) indicates that there were few students with expert computer skills. The majority of the students from both universities had intermediate computer skills, meaning that they were able to perform most but not all tasks effectively. There were no significant differences in computer skills between the male and female students at both universities. These findings therefore indicate that most of the students were likely to require some assistance while using computers in their libraries.

**Table 2: Information retrieval skills**

Information retrieval skills	Institution	Strongly disagree	Disagree	Agree	Strongly agree	TOTAL
Ability to use keywords	UEAB	13%	18.5%	44.4%	24.1%	100%
	KU	15.5%	23.4%	47.5%	13.6%	100%
Ability to use Boolean operators	UEAB	21.2%	21.2%	48%	9.6%	100%
	KU	31.9%	33.3%	28.8%	6%	100%
Ability to limit searches	UEAB	5.5%	29%	44.8%	20.7%	100%
	KU	19.2%	21.8%	48.2%	10.8%	100%
Ability to gather information comprehensively	UEAB	5.5%	23.5%	56.5%	14.5%	100%
	KU	13.6%	23.5%	52.1%	10.8%	100%
Ability to save/retrieve/print search results	UEAB	10.9%	7.3%	40%	41.8%	100%
	KU	13%	21.5%	41.9%	23.6%	100%

The students were asked to assess their own competencies with regard to information retrieval skills. The findings (see table 2) indicated similarities among the students from both universities. The majority of the students from both universities possessed basic search skills: most were therefore able to perform a keyword search, use Boolean operators, limit searches, gather information comprehensively, and save, retrieve and print the search results.

**Table 3: Students' knowledge of existing information resources**

	UEAB	KU
Lecturer recommends	35.3%	41.6%
Librarian recommends	3.9%	3.8%
Prior knowledge	13.7%	20.3%
Through searching/browsing	47.1%	34.3%
TOTAL	100%	100%

Data on students' knowledge of existing information resources (see table 3) indicate that they relied predominantly on the lecturers to recommend the most appropriate resources. At UEAB, 47.1% of the students were able to decide on the most appropriate information to complete a task through searching and browsing.

**Table 4: Students' awareness of new e-resources in their academic libraries**

	UEAB	KU
Leaflets/Posters in library	23.9%	6.5%
Told by librarian	19.6%	11.1%
Told by another student	23.9%	31.5%
Told by lecturer	15.3%	20.4%
Induction/Orientation	8.7%	11.1%
Posters elsewhere on campus	4.3%	2.5%
Browsing the library website	4.3%	5.4%
I do not know about the library	-	11.5%
TOTAL	100%	100%

Findings relating to the students' awareness of new e-resources (see table 4) indicate that

- there were several methods for creating awareness of new e-resources, including posters and leaflets in the library;
- information was given by librarian;
- information was given by lecturer;
- information was given by a fellow student;
- posters were seen elsewhere on campus;
- there was a library orientation program; and
- they browsed the library website.

The most popular means by which students found out about new e-resources in their libraries was from their peers. At KU, the lecturers contributed to creating awareness

of new e-resources in their library. At UEAB, the librarians contributed to creating awareness of new e-resources in their library. Notably, there were students at KU who were not aware of any e-resources available in their library. This could be attributed to ineffective methods used by the library in creating awareness of the e-resources.

### 5.3 THE ROLE OF THE LIBRARY IN DETERMINING STUDENTS' LEARNING OUTCOMES

The library should play a significant role in determining the students' learning outcomes by supporting the use of electronic resources. Findings relating to the role of the library in determining students' learning outcomes included

- ICT and electronic resources usage patterns; and
- perceived role of the academic libraries.

Data on electronic resources usage patterns show the habitual, consistent practices associated with the use of ICT-related services in the libraries. Usage patterns therefore focus on what the students and library managers do while engaging in ICT-related library practices.

**Table 5: ICT usage patterns among students**

Electronic resources type	Institution	Daily	Weekly	Monthly	No use at all	Total
Online hosts	UEAB	21.8%	32.7%	32.7%	12.8%	100%
	KU	9.1%	18.4%	24.7%	47.8%	100%
Database Packages	UEAB	5.4%	20%	27.3%	47.3%	100%
	KU	4.9%	14.1%	33.1%	47.9%	100%
E-mail	UEAB	52.7%	27.3%	9.1%	10.9%	100%
	KU	12.7%	32%	25%	30.3%	100%

Findings relating to electronic resources usage patterns among the students (see table 5) indicate that

- the majority of students at UEAB (32.7%) used online hosts for information retrieval weekly and monthly. At KU, 24.7% of the students used online hosts for information retrieval monthly. At KU the majority of the students (47.4%) did not use online hosts for information retrieval.
- the majority of students from both universities (47.3% at UEAB and 47.9% at KU) did not use database packages. Of those who did, only a few did so daily (5.4% at UEAB and 4.9% at KU).

- the majority of students at UEAB (52.7%) used e-mail daily. This percentage is much higher than the percentage of students who do so at KU (12.7%). At KU, 30.3% of the students did not use e-mail at all.

**Table 6: When last students downloaded an electronic document**

	Last week	Last month	Last semester/ quarter	Never	Total
UEAB	60.4%	15.1%	13.2%	11.3%	100%
KU	23.9%	23.9%	27.7%	24.5%	100%

Data relating to when last students downloaded an electronic document (see table 6) indicate that at UEAB, 60.4 per cent of the respondents had used library e-resources within the past week. This was the highest response score from both institutions. At KU, the highest score (27.7%) was obtained from respondents who had downloaded an e-document within the past semester/quarter. At UEAB, 11.3 per cent and at KU, 24.5 per cent of respondents indicated that they had never downloaded an e-document.

**Table 7: Use of e-resources to meet students' personal learning needs**

	Institution	Always	Sometimes	Never	Total
Do library e-resources support your academic learning?	UEAB	55.6%	31.4%	13%	100%
	KU	42.5%	47%	10.5%	100%
Does the use of library e-resources contribute to improved standards in your work?	UEAB	57.7%	40.4%	1.9%	100%
	KU	35.7%	50%	14.3%	100%
Do library e-resources meet your needs in terms of formal learning?	UEAB	44.2%	42.3%	13.5%	100%
	KU	24.7%	59.6%	15.7%	100%
Do library e-resources meet your needs in terms of informal learning?	UEAB	39.1%	50%	10.9%	100%
	KU	13.3%	65.4%	21.3%	100%

The data (see table 7) indicated that the use of e-resources by students varied between the two institutions:

- The majority of the UEAB students (55.6%) indicated that the use of e-resources “always” met their personal learning needs, improved the standard of their academic work and supported learning (44.2%); and
- The majority of the KU students (47%) indicated that the use of e-resources

“sometimes” met their personal learning needs, improved the standard of their academic work (50%), and supported learning (59.6%).

By indicating that the e-resources “sometimes” met their learning needs, the students at KU library meant that they had no guarantee that the e-resources provided in their library actually supported their learning. The differences in students’ responses can be attributed to the following:

- Library budget allocations. While the UEAB had a budget allocation, KU library did not;
- Participation by faculty members in the selection of library resources. KU lecturers did not participate in the selection of library resources; consequently, the students found that most of the e-resources did not meet their needs. At UEAB, the students found the library resources suitable for their needs because the faculty members participated in selecting those resources; and
- Need for faculty–librarian collaboration. This data indicated that if academic libraries are to meet the students’ formal and informal learning needs, there has to be faculty–librarian collaboration.

## 5.4 THE ROLE OF ACADEMIC LIBRARIANS AT UEAB AND KU

Librarians need to redefine their role in accordance with the functions of the academic library. This will enable them to perform core functions effectively, specifically as agents of information dissemination. For the role of librarians to be well defined, libraries need to

- develop programmes that provide effective training in the use of e-resources, such as information literacy programmes;
- involve faculty members in the selection of library e-resources; and
- establish effective communication between library staff and academic staff regarding changes to academic curricula.

**Table 8: The role of academic librarians at UEAB and KU**

Role of librarian	Institution	Strongly agree	Agree	Disagree	Strongly disagree	Total
Should the library support teaching by encouraging new teaching methods?	UEAB	33.4%	66.6%	–	–	100%
	KU	–	87.5%	12.5%	–	100%

Role of librarian	Institution	Strongly agree	Agree	Disagree	Strongly disagree	Total
Should library managers be involved in the development of courses?	UEAB	33.3%	33.4%	33.3%	–	100%
	KU	11.1%	44.4%	33.4%	–	100%
Do library managers want to be informed about changes to courses?	UEAB	100%	–	–	–	100%
	KU	88.9%	11.2%	–	–	100%
Should library managers provide induction and training for academic staff on the use of resources to support teaching?	UEAB	100%	–	–	–	100%
	KU	88.9%	11.1%	–	–	100%

The data relating to the role of academic librarians in table 8 show that

- the library should support teaching by encouraging new teaching methods;
- the library managers should be involved in the development of new courses;
- the library should be informed about changes to courses; and
- the librarians should provide induction and training for academic staff on the use of resources, focused on supporting teaching.

The findings indicate that the library managers at both universities wished to collaborate with faculty and to participate in the role of teaching students. For effective collaboration, the library managers must be involved in the development of new courses and be informed about changes to courses. Faculty members may hold the perception that librarians know nothing about course-related resources and are not qualified to guide students in their academic work. This perception will have to be changed if there is to be a meaningful collaboration between the two groups.

## 6 FINDINGS

The main findings of the study were as follows:

- ICT activities at the KU library have been greatly affected by the lack of adequate infrastructure, including a limited number of computers, an incomplete network, and slow internet speed;
- Students' electronic resource usage patterns indicated higher usage at UEAB than at KU. However, general usage remained low (below 50%) at both academic libraries;

- Academic librarians were perceived to have an insignificant contribution to make to teaching and learning at both universities;
- Pertinent issues affecting the use of electronic resources (such as access and awareness) had not received attention at either university library;
- University librarians at both libraries lacked up-to-date ICT skills to help them cope with the current challenges at their workplaces; and
- There was no close association between faculty and librarians, which affected the role of academic libraries in teaching and learning.

## 7 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made for improving the use of electronic resources at UEAB and KU to support formal and informal learning:

- The KU and UEAB academic libraries should develop clear ICT policies in order to make their ICT sections fully operational;
- The KU and UEAB academic libraries should develop ICT skills training programmes incorporating information literacy guidelines to equip the students with relevant ICT skills to access and use available electronic resources;
- The KU and UEAB academic libraries should re-skill their librarians to ensure that they have expert ICT skills to guide students in the use of electronic resources;
- The library managers at KU and UEAB academic libraries should advocate faculty–librarian collaborations in order for the library to facilitate greater usage of available electronic resources;
- Both academic libraries should find effective ways to promote their services, together with evaluation systems to measure the effectiveness of the new methods;
- The KU and UEAB academic libraries should be redesigned to match current technological trends by making available more computers and enhanced networks to support access to electronic resources;
- The library managers should pay attention to library staff needs, such as ICT training to acquire relevant skills for current workplace demands; and
- The universities, in consultation with the libraries, should develop an information literacy (IL) programme through which students would learn how to use and access the available electronic resources in their libraries. An IL programme such as this, if established, would enhance faculty–librarian collaborations at both university libraries, and lead to increased use of electronic resources.

## 8 CONCLUSION

Patterns of response reveal clear differences between the two universities. UEAB emerges as a university with a higher level of ICT integration, where the students have basic computer skills and the library has an adequate ICT infrastructure. KU, on the other hand, appears to be at an early stage of ICT integration. For example, the library LAN at KU library is still incomplete. The students' responses confirm the need to develop the ICT infrastructure, and to equip the students with ICT skills.

From the data generated, it is readily apparent that the roles of UEAB and KU libraries should be redefined, and that both students and faculty members should become fully aware of the valuable services that the libraries have to offer. Finally, both UEAB and KU need, as a matter of urgency, to develop and implement an effective IL programme if they are to put the recommendations given above into effect. An IL programme would help train the students to use electronic resources for formal learning, and to develop lifelong learning skills for informal learning.

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