Qualitative and Quantitative Methods in Libraries (QQML) 4:787 809, 2014

The changing IT trends: are academic libraries coping?

Maria G. N. Musoke[1], Timothy Sentamu[2] Andrew Mwesigwa[3]

[1]Prof. of Information Science & Univ Librarian, Makerere University
[2]Systems Administrator, Makerere University Library
[3]Academic Librarian, Makerere University

Abstract: The modern academic library environment is changing not only to cope with technological advancements, but also to organise, preserve and make knowledge accessible in real time. The current technological developments, the increased library user expectations and users' participation in the information chain e.g through social media have been the major catalysts for automation. By 2013, Makerere University (Mak) Main Library alone had over 474 Personal Computers (PCs) in its bid to integrate Information Technologies (ITs) in library functions. However, in recent times, there has been evidence of own laptops' usage by Mak Library users. In response to this trend, Mak Main library redesigned space in 2012 to provide data points to accommodate laptop users as the wireless connection infrastructure could no longer handle the exponentially increased user population at Mak library. The paper reports findings of a quantitative study that investigated the usage of the Main library IT facilities, users' preferences and whether the various IT facilities were meeting the users' needs and expectations. The findings revealed that 22% (1221) of the 5,472 library users, at the time of collecting data, were found using library IT facilities, while the rest of the library users 78% (4,251) were engaged in private study, discussions in the Group study facilities or were using other library facilities and services. The 22% found using library IT facilities reported to have used the following: 46% Learning Commons for undergraduates, 4% Research Commons for postgraduates and researchers, 16% OPAC terminals, 2% lab for users with disabilities, 10% laptop users' lab and 22% own laptops connected to the LAN in the rest of the Main library building. Of the 22% who used library IT facilities, only 38% owned laptops, hence confirming the continued need for library PCs. The study highlighted reasons for the preferred IT facilities and its implications for policy on academic library service delivery. The findings confirmed that Mak Main lib had tried to cope with the changing IT developments and user behavior to remain relevant to the academic and research community served.

Received: 24.7.2014 / Accepted: 14.11.2014 ISSN 2241-1925

Keywords: IT usage, Computers in Libraries, Academic Libraries, Makerere University library.

1 Introduction

Makerere University is the oldest University in East Africa, having been established in 1922. Since the 1990's, there has been a proliferation of Information Technologies (ITs) in the Ugandan higher education sector in general with Makerere University (Mak) taking the lead at a national level. From then, IT services and facilities have been gradually improving in quality and quantity in most institutions and at a personal level. By 2013, Mak Main library alone had over 474 Personal Computers (PCs) in its bid to integrate ITs in all library functions and to address the National Council for Higher Education's (NCHE, a regulatory body) standard of 1 computer to 5 students. This is coupled with the objective of supporting the Mak's core function of providing innovative teaching, learning, research and services responsive to national and global needs. As the technological era increased demand for library IT-driven services, Mak library inevitably started the automation drive in the late 1990s (Musoke, 2007) with support from Mak, Government of Uganda and development partners. In 2007, through the efforts of the University Librarian and her team, Mak library won a competitive grant from the Carnegie Corporation of New York (CCNY) to support library automation and the acquisition of core textbooks (Musoke & Mwesigwa, 2013). Among other things, 323 computers were procured using the grant to facilitate the setting up of the Research Commons (100 PCc) for postgraduate students and researchers, Learning Commons (150 PCs) for undergraduate students, a multi-purpose training laboratory (32 PCs), Multi Media unit (10 PCs) for the first time at Mak Main library, OPAC terminals (20), Computer laboratory (lab) for users with disabilities (08) and (03) laptops. Earlier, Mak Main library had set up a lab for users with disabilities (05 PCs and an Embosser), OPAC terminals (22 Thin Clients), older computer labs and workrooms (124 PCs), lab for laptop users, spaces in the main library with wired and wireless connectivity to the Local Area Network (LAN), various software packages with support from the Swedish International Development Cooperation Agency (SIDA), Norwegian Agency for Development Cooperation (NORAD), Uganda Telcom and Mak. In addition, ordinary computer laboratories were set up in branch/College libraries (64 PCs). In the case of Mak library, the increase in student population has brought about the need to assess whether the IT facilities provided were coping with the student numbers and what the students' preferences were between using the Mak library computers and their own personal computers (Laptops) while in the Mak Main library. Consequently, in March 2014 Mak librarians conducted desktop and laptop computer use study to, among other things, assess the level of usage and preference by the students and other library users. The study would then enable Mak library to determine whether its IT facilities were coping with the population of library users and whether the facilities were meeting users' needs.

2. Scope of the study

The study was conducted at Mak Main library in March 2014. The Main library IT facilities included: Learning and Research Commons, Laptop users' computer lab, Computer lab for users with disabilities, wired data points and Laptop users in the rest of the Main library building. The study focused on the usage of desktop computers, laptops and OPAC terminals in the Mak Main Library.

3. Significance of the study

The purpose of the study was to assess the usage of IT facilities including the newly acquired computers at Mak Main library. Among other things, the study results would provide information that may justify further investment in IT infrastructure as Mak library continues on the journey to integrate ITs in all library functions. Thus, the study results will benefit the library users, library management and staff by providing the indispensable facts about the existing IT usage trends. The study will then serve as the basis for future plans of action by Mak and Library management who will have a better understanding of the achievements, strengths and limitations of the IT facilities and services in the library. Furthermore, as the study will provide current information about IT facilities at Maklib, its findings may be relevant and useful to other academic libraries in the developing world.

4. Objectives of the study

Mak library management commissioned the study to find out:
a) Who the actual users of the Main lib IT facilities were;
b) Whether the:

- lib users were aware of the existence of the various IT facilities in the Main Library;
- users preferred Lib PCs or their own (laptops);
- various IT facilities were meeting the library users' needs & expectations;
- lib PCs were being fully utilised;
- IT facilities were coping with the user population.

5. Research Questions

From the above objectives, the following research questions were designed:

1. Who are the users of the different IT facilities in the Main library?
2. Are the Main Library users aware of the existence of the different IT facilities and services?
3. What is the preference of the library users between the library's computers and their own laptops; and why?
4. What are the library IT facilities and services used for?

5. Do the library IT facilities and services meet the user needs and expectations?
6. What are the views of users concerning the IT facilities and services in the Main Library?

From the above objectives and research questions, the following indicators were designed to guide the researchers in measuring the study outputs:

1. Number of users found at the Main Library IT facilities during data collection by gender, College, course & category.
2. Number of respondents who were aware of the specified IT facilities and services;
3. Number of users who preferred Library PCs to their laptops & reasons for their choice;
4. Specified use of IT facilities and services by number of respondents;
5. Reported needs and expectations met and shortcomings by number of respondents;
6. Specific comments about IT facilities and services made by respondents.

6. Literature Review

In the current era, technology has taken the fore front as the major enabler of learning and research in academic libraries. Several scholars have demonstrated the fact that expectations and demands of library users in an academic environment, where IT has been applied, have grown; hence the need to respond to users' preference for an IT-facilitated research, teaching and learning as well as academic library service (Aviles & Eastman, 2012; McMahon & Pospisil, 2005; Gardner & Eng, 2005; Jonas-Dwyer & Pospisil, 2004; Shaw & Fairhurst, 2008). This was further supported by Katz (2002) who stated that there were changing expectations in terms of ICTs in universities where there was early adoption of technology, while the emergency of smart phones and palm top computers meant that students conducted all their academic activities over the internet. However, many institutions of higher learning in the developing world are miles away from delivering such an environment for their students (Ramzan & Singh, 2008; Natukunda, 2004). Much has been said about the need for IT facilities to ably cater for the student population in academic institutions and considerable research has been done in the Western world to assess the effect of IT facilities on student progression and activities (Ani, Esin & Edem, 2005; Wakeham & Garfield, 2005; Massis, 2011; Thompson, 2012).

The most relevant study retrieved was by Lugya & Mbawaki (2011) which focused on the usability of the Mak library online catalogue interface as reported by users. The rest of the studies related to the current study topic and with a focus on Uganda and/or Mak library (Tibenderana, Ogao, Ikoja-Odongo & Wokadala, 2010; Atwongyeire, 2010; Musoke, et al, 2005; Musoke & Kinengyere, 2008; Okello-Obura, 2000; Nassali, 2001) focused on the genesis

and progress of library automation, IT needs assessment, usage of IT to deliver library services and usage factors of electronic resources usually from the librarians' point of view. Hence, the need to conduct the current study to find out the users views about the library IT facilities. It was reported by Gould and Gomez (2010) that a great amount of resources had been invested in ICTs in developing countries. This confirmed that automation is a never ending effort – a lesson learnt by Mak librarians (Musoke, 2010) as Mak library has been on an automation drive for over fifteen years. However, with the availability of IT driven resources from the various service providers coupled with the changing user behaviour, there is need to assess whether the Mak library IT facilities still serve the needs of users and whether Mak library is coping with the changing trends. Babu and Krishnamurthy (2013) described such trends as a change of emphasis from library automation to enhancing discoverability of library resources.

Findings from some previous studies also suggest that there is high usage of the internet and electronic resources by both students and staff in institutions of higher learning, and where low-usage exists, it has been attributed to the inappropriate computer-student ratio, that can be addressed by increasing the number of computers. Due to the high costs of IT facilities and the growing user population versus the National Council for Higher Education standard of 1:5, Musoke (2008), Atwongyeire (2010) and Dadzie (2005) argued for increased provision of PCs for library users, which is relevant in the context of Mak library. That view contradicts Thompson's (2012) who pointed out that with the emerging of mobile technologies, there are questions whether libraries should continue providing dedicated desktop computers and whether students still value the access to the computers in the Library. Thompson (2012), Tenopir (2003) and Kumar & Biradar (2009) further justify the need to conduct the current study at Mak library. It was therefore timely to find out the views of users about the improved IT facilities.

7. Research Methodology

The previous studies conducted on related topics either used qualitative, quantitative or triangulation methods. For instance, the study of e-resources usage in academic and research institutions in Tanzania used both qualitative and quantitative methods (Manda, 2005).

The current study used mainly a quantitative method. To a less extent, an observation method, which is qualitative, was used to identify the library users with laptops and those using other IT facilities in the entire Main library building. The observed IT facilities' users were then requested to participate in the study by filling a two-page questionnaire, which was the main data collection tool. The questionnaire (in appendix) had 13 questions, 5 of which were open-ended and focused on how and why to enrich the data.

Sampling: The sample was purposively selected to include all library users who, at the time of collecting data, were found using laptops in different parts of

the Main library building, OPAC terminals and computers in the laboratory (lab) for users with disabilities and in the Learning and Research Commons.
The sample size was 1,221 library users out of a total of 5,472 users who were in the Main library at the time of collecting data.
Data collection: was carried out once a day for six days from Monday 17th to Saturday 22nd March 2014. In order to capture a greater diversity of library users, data was collected at different times, that is, mornings, afternoons and evenings as table1 shows:

Table 1: Day and time of data collection

Day	Time	Total Hours
Monday 17th March	Late afternoon (15:17 – 17:11)	1 hr 54 mins
Tuesday 18th	Morning (9:10 – 10:55)	1 hr 45 mins
Wednesday 19th	Evening (18:00 – 19:37)	1 hr 37 mins
Thursday 20th	Afternoon (15:00 – 16:38)	1 hr 38 mins
Friday 21st	Midmorning (11:00 – 12.36)	1 hr 36 mins
Saturday 22nd	Morning (10:00 – 11:58)	1 hr 58 mins
Total		**10 hrs 28 mins**

The study covered all the five floors of the Main Library building targeting users of IT facilities. Each new day of data collection, users of IT facilities were asked whether they had previously completed the study questionnaire and those who had done so did not repeat the exercise.
Data analysis: Quantifiable data was entered in a Google form and was automatically analyzed by the Google spreadsheet application. While qualitative data was categorized into themes.

8. The Findings

This section reports both the general findings and the specific answers to the questions in the questionnaire (appendix 1).

8.1. General findings

a) Comparing the Usage of IT facilities with other services and facilities in the Main Library

The study revealed that 1,221 respondents (22% of the 5,472 library users of the Main library at the time of collecting data) were actually found using IT facilities, while 4,251 (78%) were using the rest of the Main library facilities and services. This implies that other services and facilities provided by the Main library are still important to the majority of library users.

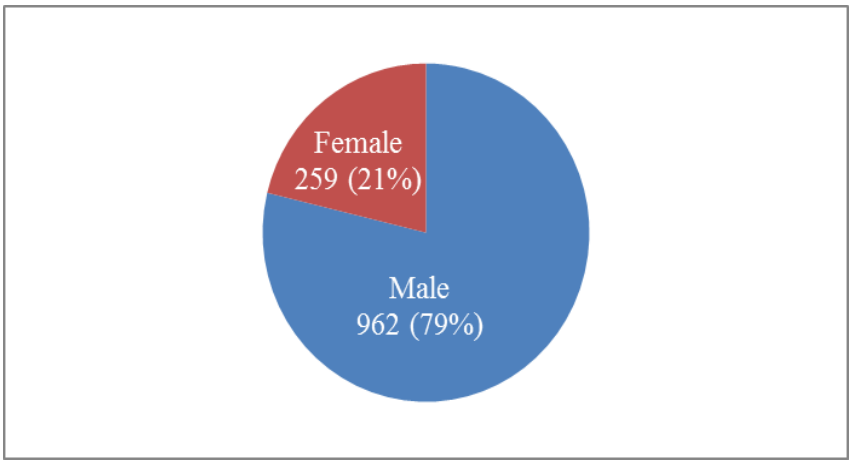
8.2. Specific findings

Answers to the specific questions in the questionnaire are provided in this section.

8.2.1. The gender of library users who participated in the study (question 1)

The study revealed that there were more male respondents (79%) than females (21%) as figure 1 below shows. That finding was not surprising as it was in line with Mak student enrolment that had more males (53%) than females (47%) in 2013/2014 (Musoke & Mwesigwa, 2013). However, over the years, there has been a steady improvement of female enrolment in higher education as a result of Uganda Government affirmative action policy.

Figure 1: Respondents by Gender



8.2.2. Respondents by College and Course (question 2 and 3)

As indicated in table 2 below, there were differences in usage of the Main library IT facilities by Colleges with CoCIS taking the lead at 24%, while CHS (4%), COVAB (3%) and School of Law (2%) were the least users. This confirmed that users from CoCIS who have to use computers for most of their course work greatly benefitted from the IT facilities at Mak library. CoCIS was followed by the College of Business and Management Sciences (CoBAMS)

with 18%, and the College of Humanities and Social Sciences (CHUSS) with 17% of the respondents.

The low usage by CHS can be attributed to the fact that data was collected during day when students and staff of CHS are in their college, situated 2km away and with a fully-fledged and biggest branch library. For CAES, the low usage may be due to the fact that majority of the postgraduate students and the second year undergraduate students spend most of their time at the University Farm, that is located over 15km away from the Main Mak campus. The University Farm has a Library and computer facilities to support teaching and research. Library users from the School of Law, on the other hand, tend to use other library facilities as recently revealed by Musoke & Mwesigwa's study (2013).

Despite the differences in usage, Mak Main library IT facilities were generally used by the different colleges and disciplines. It was an indicator that the investments towards automation efforts at Mak library, that have been made by Makerere University fee-paying students and their sponsors, Uganda Government, Development partners such as CCNY, SIDA & NORAD, were worthwhile.

It is also noted that Table 2 has some 24 respondents (2%) as external users. Besides being an academic library, Mak Main Library plays the role of a National reference library since 1972 (Musoke, 2010). Some of the external users who participated in the study were students from other universities who indicated their courses. However, to maintain consistency, such respondents were taken as external users and their courses were not included in the tabulation of courses for Mak respondents.

Table 2: Respondents by College and Course

College	Number of respondents	Percentage
Computing & Information Science **(CoCIS**)	296	24
Business & Management Sciences (**COBAMS**)	213	18
Humanities & Social Sciences (**CHUSS**)	212	17
Agriculture & Environment Sciences (**CAES**)	111	9
College of Education & External Studies **(CEES)**	92	8
Natural Sciences (**CONAS**)	76	6

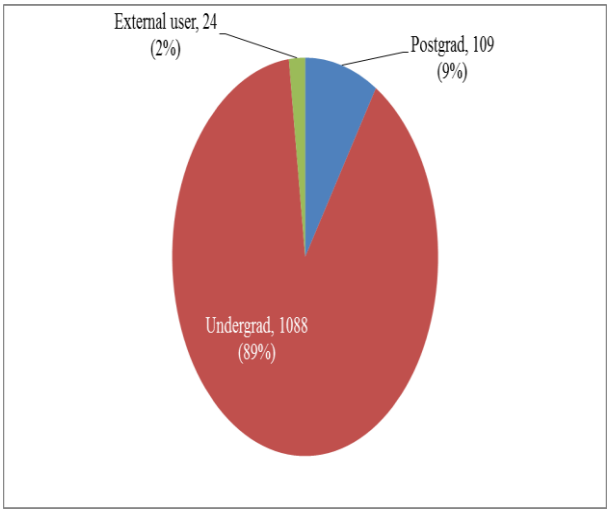
Engineering, Design, Art & Technology **(CEDAT)**	78	6
Health Sciences (**CHS**)	48	4
Veterinary Medicine, Animal Resources & Biosecurity **(COVAB)**	32	3
School of Law	39	3
External Users	24	2
Total	**1,221**	**100**

The detailed list of courses undertaken by respondents per College (question 3) was compiled in a three page table for future reference by the Mak Library Management and the ICT section. The summary of the Colleges is provided above.

8.2.3. Category of respondents (question 4).

The majority of respondents (89%) were undergraduate students, while 9% were postgraduate students and 2% were external users (Figure 2). That finding was expected given the fact that Makerere University had 49,691 students in the 2013/14 academic year of whom only about 5025 were postgraduates. Furthermore, most of the postgraduate students are employed and they tend to use facilities in their offices rather than the Main Library.

Figure 2: Category of respondents



8.2.4. Respondents' awareness of the presence of different IT facilities in the library (question 5)

The responses to this question were multiple as respondents were aware of more than one IT facility. The study revealed that respondents were aware of the various Library IT facilities as follows: 24% of the respondents were aware of the existence of the Learning Commons, 21% lab for laptop users, 20% Online Catalogue terminals, 15% ICT support services, 11% Research Commons and 9% Computer lab for users with disabilities. Given the fact that the Learning Commons is a facility dedicated to undergraduate students, the highest awareness of 24% is in line with what was reported in section 8.2.3 above which showed that the majority of respondents (89%) were undergraduate students. Other scholars have also reported the influence that awareness of IT facilities has on their usage in academic libraries (Tibenderana et al., 2010). With a bigger number of undergraduate students, the usage of the Learning commons is expected. However, it has been noted that Mak Main library's End-user orientation and Information literacy sessions contribute greatly to the undergraduate students' awareness of the presence of all library resources and services including IT facilities. The apparent lack of awareness among some users, therefore, may stem from the fact that some students could have missed the end-user sessions as revealed by Musoke & Mwesigwa's (2013) study, and had earlier been reported by a similar study in another developing country (Boakye, 1999).

Table 3. Respondents' awareness of the presence of different IT facilities in the library

IT facility	User awareness of the IT facility (Multiple responses)	Percentage
Learning Commons	335	24
Research Commons	168	11
Computer lab for users	331	21
ICT support Services	238	15
Online Catalog Terminals	316	20
Computer Lab for users with disabilities	132	9

8.2.5. Usage of the different IT facilities in the Library by the respondents (question 6).

The study findings indicated that the most commonly used IT facility was the Learning Commons (46% - 828 respondents) for undergraduate students (Figure 3). The finding confirmed that library users were still interested in the desktop computers provided by Mak Main library. Previous studies agree with this finding (Thomson, 2012; Byrne, 2013; Buhay & Best, 2014).

On the other hand, the computer lab for users with disabilities was the least used (28 respondents -2%). This could have been caused by the following factors:

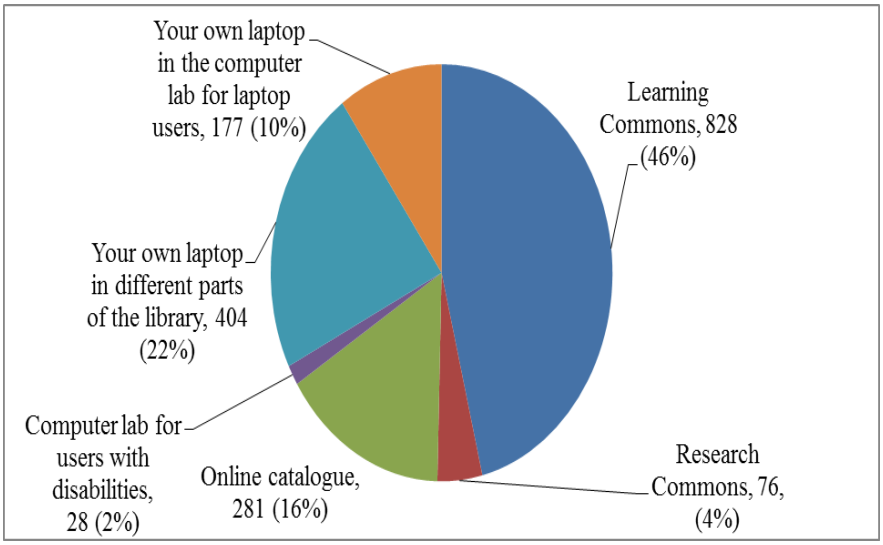
a. The number of users with disabilities at Mak University (about 120) is low as compared to the rest of the student population.
b. It is difficult for some users with disabilities to go to the library if they have no guides.
c. Some users with disabilities might not be aware of the presence of a dedicated computer lab for their use.

The responses to this question were multiple as some respondents used various IT facilities. The study findings revealed that out of the 1,794 responses, 68% of them indicated usage of library-provided IT facilities as compared to the usage of own laptop at 32% of the responses. The percentage was calculated as follows:

$$\left[\frac{\textbf{No of users of library IT facilities}}{\textbf{Total no of multiple responses}}\right] \textbf{x 100} =$$

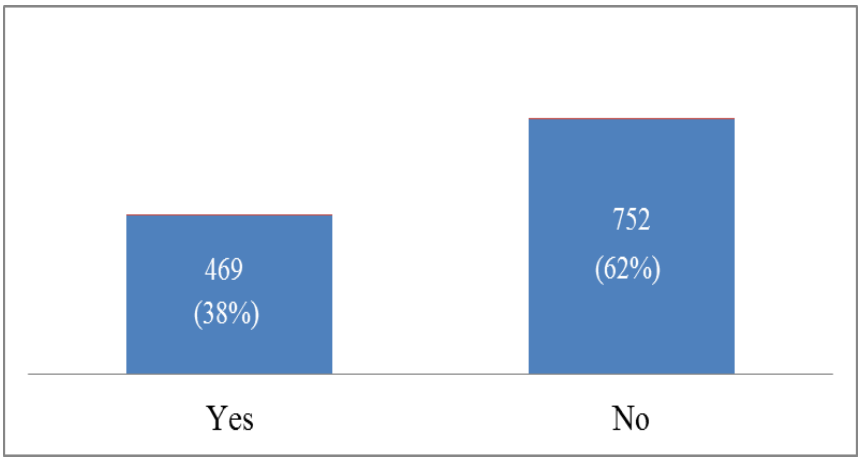
$$\left[\frac{\textbf{1213}}{\textbf{1794}}\right] \textbf{x 100 = 68\%}$$

Figure 3: Usage of different IT facilities in the Library by the respondents.

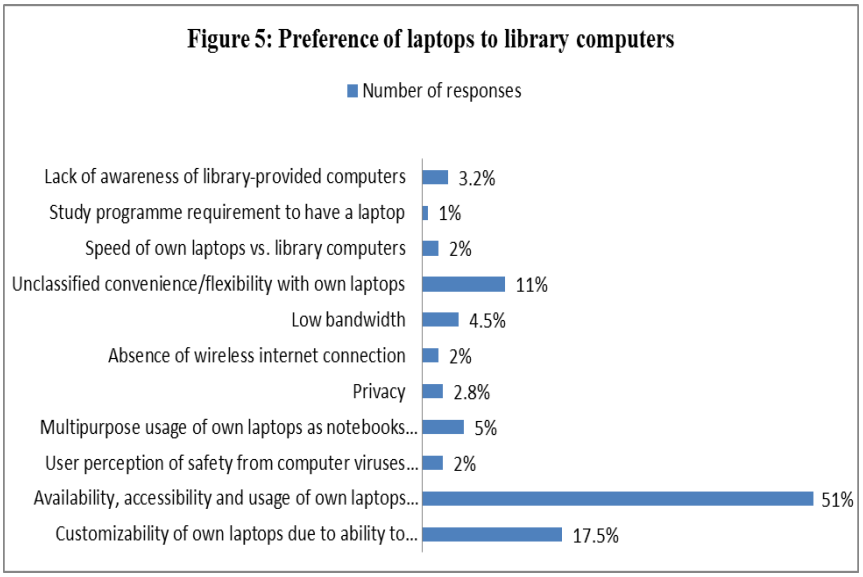


8.2.6. Respondents who owned laptops and those who did not (question 7)
Some 38% of the respondents owned laptops as figure 4 shows. The finding confirmed that Mak Library management's decision to innovatively create space with wired Local Area Network (LAN) connectivity for laptop users was timely.

Figure 4. Respondents who owned laptops and those who did not



The above findings indicated that whereas 469 respondents (38%) owned



The overarching explanation given by respondents for preference of owns laptops to library computers were the fact that they (computers) were fewer than the number of library users - an indicator of the overwhelming usage and pressure on library PCs. The NCHE recommended ratio is 1 computer to 5 students whereas the Maklib ratio was 1 computer to 47 students at the time of collecting data. The high user to library computer ratio explains why the cross-cutting theme derived from the reasons for the preference of own laptop by the few (38%) of respondents who owned laptops, was the availability of own laptops due to the inadequate number of library computers and accessibility beyond the library opening hours. Maklib like some academic libraries around the world (Thompson, 2012) has made deliberate efforts to address the computer-user ratio.

An enabling environment that encouraged usage of laptops in the library was provided by library management at Maklib when space already fitted with wired LAN data access points was innovatively turned into a computer lab designated for laptop users to facilitate access to the internet and to decongest the Commons. Furthermore, data points were extended in the rest of the library building to facilitate laptop users. Hsieh & Holden (2008) also reported the preference of own laptops to library computers among library users.

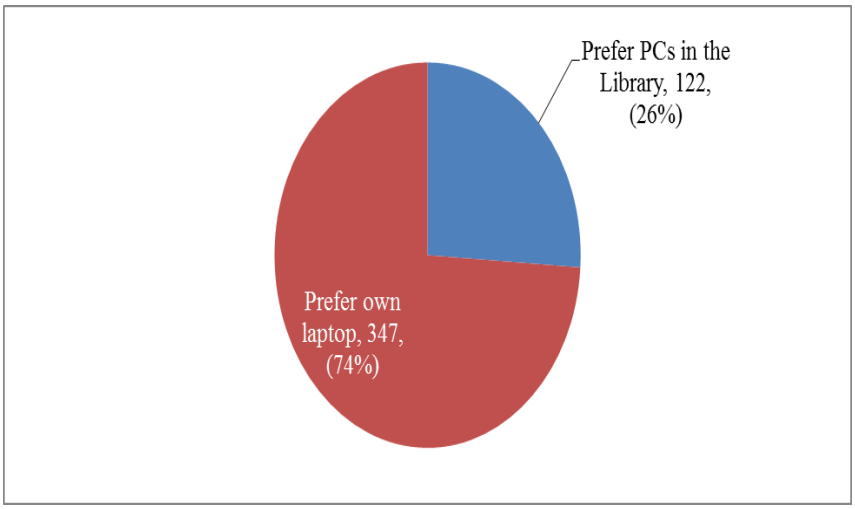
This could also be explained by some of the security restrictions of using library computers that were expressed by some respondents in the current study, including restrictions not to save downloads on the library computers, which necessitate use of external storage devices.

8.2.8

a) Preference for library computers to own laptops

Question 9 was: If you use both the computers in the Library/Computer lab and your own laptop, which one do you prefer and why?

Figure 6: Preference of library computers to personally owned laptops



As already indicated, 38% of respondents who owned laptops were expected to respond to this question; however, it was noted that there were six extra responses, which means that some respondents who did not own laptops could have answered this question. All lap top owners also used library PCs. When asked about preference between library PCs and own laptops, 122 (26%) respondents reported that they preferred the Library PCs to own laptops, while the majority, 347 (74%), preferred their own laptops as seen in figure 6 above. Despite that preference and ownership of laptops, Mak Main library users still used library PCs, which agrees with Byrne (2013) who reported that the convenience of not carrying a laptop, among other things, made students continue using academic library PCs even when they owned laptops.

b) Reasons for preference of library computers to own laptops

The second part of question 9 required respondents to give reasons for preference of library computers to own laptops. In order to analyse the responses to this question, the authors categorised the responses by themes and counted the thematic responses accordingly so that some statistical analysis was made as seen below:

Table 4: Reasons for Preference of Library Computers to Own Laptops

Reasons for Preference of Library Computers	Percentage of Response
Operational performance of library computers rated as satisfactory by users hence met academic work needs	29.5%
Accessibility to internet connectivity	37.5%
The only available option as users did not own laptops	7%
Convenience and safety as it eliminates need to carry own laptop	26%
Total	100%

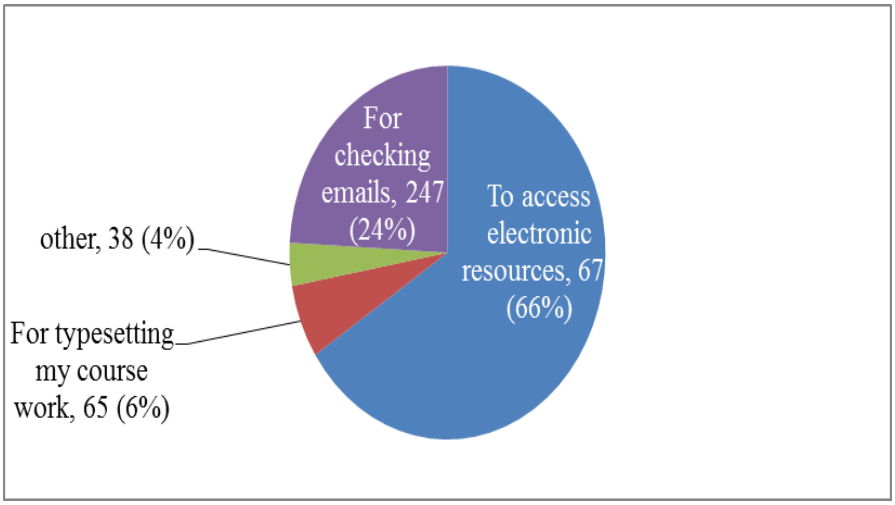
According to table 4, most responses (37.5%) indicated that access to good internet connectivity was the highest ranked reason for preference for library computers. 26% responses revealed that users who owned laptops expressed relief from inconvenience and insecurity that previously had to be borne if they had to carry own laptops to the library. This finding is similar to what Byrne (2013) reported as a reason why users expect academic libraries to invest in provision of IT facilities such as computers. The study further revealed that library computers at Maklib were in good working condition and 'fit for use' which partly explained why respondents preferred library computers 29.5% to own laptops. This also justified continued library IT maintenance budget resources.

8.2.9 Purpose for using Library Computers/Commons/Computer Labs.
Question 10 was: What do you use the Library/Commons/Computer lab for?
The study also found out what the library Computers/Commons/Computer labs were used for in order for Library management to know where the IT resources could be channeled for better utilisation. Respondents gave more than one responses to this question. From f**igure7** below, the majority of respondents 66% used the Library computers to access electronic resources, 24% for checking emails, etc. The findings of this study agree with Manda's (2005) whose respondents also indicated that they used computer resources for multiple purposes.

Use of library PCs
The ICT section had innovatively installed monitoring software to inform library management of what the library PCs were being used for. The study

revealed that 66% of the respondents used library PCs to access online academic resources, an indication of optimisation of the available PCs.

Figure 7: The purpose for using Library Computers/Commons/Computer Labs.

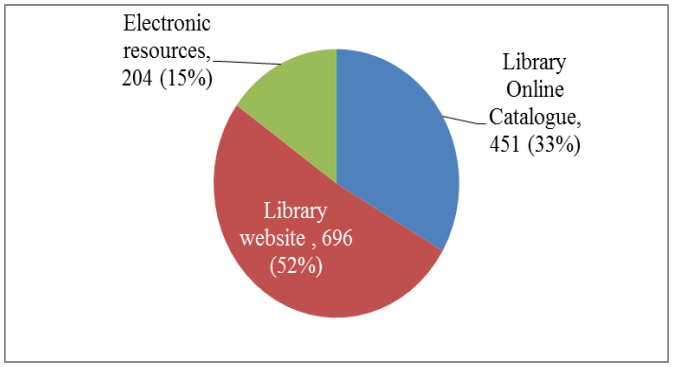


8.2.10 Awareness of what can be accessed in the Library using laptops and or smart phones

Question 11 was: Are you aware that while in the Library, you can access the following services using your laptop and/or smart phone?

It was encouraging to note that most of the respondents were aware of the resources that could be accessed in the library using various electronic devices as figure 8 shows.

Figure 8: Awareness of what Library resources can be accessed using laptops and or smart phone



8.2.11 General comments on the ICT facilities and services in the Library
a) Question 12 was: Comment on ICT facilities and services in the Main Library?

Responses were categorized in two themes:

i) Appreciative messages included (684):

- E.g. "ICT facilities are really good"; "facilities are generally good"; "the IT facilities are reliable"; "Am appreciative of the service provided to those without laptops".

It is encouraging to observe that majority of respondents appreciated the IT facilities in the library.

ii) Expressions of need to improve lib IT facilities & services included:

- i) Bandwidth & wireless signal (1248 responses)
  - E.g. "Improve the internet speed"; "Wireless network signal should be improved"
- ii) No. of PCs (510 responses)
  - E.g. "The computers are not enough… queues are inconvenient"; "time allocation should be increased"

It was important to note that Mak was committed to making the IT facilities better and it had already taken a move to improve the slow internet that was due to low bandwidth. Mak had also changed its internet service provider to a faster connection through the Research & Education Network for Uganda (RENU). Consequently, plans were underway by the Directorate for ICT Support (DICTS) at Mak to source for funds to revamp the wireless network.

b) Question 13 was: Any other comments are welcome.

Responses were also categorized in two themes:

a) **Appreciative messages included (171):**

- E.g. "Thanks for the good facilities"; "I thank the library management for the good job and pray that this continues"; "I recommend the services provided, please keep it up".

b) **Expressions of need to improve other lib facilities & services (513) included:**

- E.g. "I am disturbed by the noise outside the library vicinity and on some floors within"; we need more discussion rooms".

Response to some comments about Mak Main lib IT facilities and services

- To control noise, Library management has enforced the usage of designated noisy areas and mobilized library security staff to be more vigilant than before.

9. Implications

This section highlights implications for library service delivery and further research.

9.1 Implications for Library Service Delivery

The fact that only 38% of the respondents owned laptops at the time of collecting data implied that Maklib needs to provide more space with a stable wireless connection and Ethernet ports. Secondly, given that 62% of the respondents did not own laptops, Maklib has to continue investing in PCs and to regularly replace obsolete ones.

With the rapid advances in IT and the corresponding changing user behaviour, there is need to conduct regular end-user training to keep the users updated with the IT skills and knowledge.

The high usage of Learning Commons (46%) was an indicator that Mak library's change from mere computer lab was timely. The Commons need to be regularly updated with software and hardware.

The change from a Comp lab to Commons has also created increased demand for staff time and change in mind set in order to provide the support needed by users. Hence, Mak librarians need to dedicate time to provide support to researchers and postgraduate students to fully utilise the Research Commons.

9.2 Areas for further research

The current study should be extended to cover a longer period of time such as a full academic year or a semester to show the trend of IT usage throughout the year/semester. Such a study should have a representative sample of all library users.

10. Limitations of the study

Some of the limitations identified are:

a. The timing of data collection at the beginning of the semester could have had a higher computer usage than before examination time when most students usually revise their lecture notes.
b. The students' Guild campaigns in March could have affected the library traffic and reduced the number of respondents.
c. Data was collected in only 6 days (Monday to Saturday) and it ranged between 1:45 to 2 hours per day in March 2014. A longer duration of data collection would probably have yielded different results. Furthermore, data was neither collected on Sunday nor after 7.30pm during the week and yet the library opened up to 11.00pm. However, given the fact that all library users who were using IT facilities in the library at the time of collecting data participated in the study makes the findings credible and a good starting point for further research.

d. Library users who were found using IT facilities (22) versus the rest (78%) only participated in the study. It is likely that the results could be different if a representative sample of all library users found in the Main library at the time of collecting data was used.

11. Conclusions

The presence of respondents from all colleges and disciplines was an indicator that Mak main library services and facilities are needed. The findings confirmed, among other things, that the majority of library users (62%) still needed the PCs provided by Mak Main library as only 38% owned lap tops. The high population of library users, vis-à-vis the number of computers has created queues for computers that have compelled some students (38%) who could afford to opt to buy/use their laptops. Mak Library had solicited for funding to improve the Library user-computer ratio and to acquire various IT facilities to enable it to cope with the changing IT developments and user behaviour. Hence Mak library has remained relevant to the academic and research community served.

Furthermore, the high awareness and usage of computer lab for laptop users confirmed that the decision by Mak library management to create such space was timely. As laptop usage continues to grow in an era of mobile technology explosion, Mak library will continue investing in wireless infrastructure. Furthermore, Mak managment has responded to the need to improve internet speed by trippling bandwidth in April 2014, a timely move that Mak library users had long been requesting for.

One of the lessons Maklib librarians had learned over the years was that automation was a never-ending process due to the dynamic nature of IT, which is changing the work of libraries in many institutions. It is essential to keep updating IT facilities to be able to provide effective information services to the users. The need for continuous professional development of librarians is key to the sustainability of the automation process.

In general the study has demonstrated that technological change poses challenges to both the library and its users. Although the results indicate that Maklib is currently trying to cope with the changing IT trends, the ever increasing student population implies that more needs to be done to maintain and sustain the current automation efforts.

Acknowledgements

Besides Makerere University's efforts to automate the library, other key players in the automation process have been the Carnegie Corporation of New York (CCNY) and the Swedish International Development Corporation Agency (SIDA). The authors are also grateful to the following staff at Mak library who participated in the study by collecting and compiling data: Brian Wamala, Monica Namagembe, Mary Babirye, Patrick Sekikome, Robinah Nabakooza and Regina Nakirya.

References

Agaba, D. (2006). Assessment of the utilisation of Mak Uni e-resources by Academic staff: challenges and prospects. Unpublished Masters Thesis, Makerere University.

Ani, O. E., Esin, J. E., & Edem, N. (2005). Adoption of information and communication technology (ICT) in academic libraries: a strategy for library networking in Nigeria. *Electronic Library, The*, *23*(6), 701-708.

Atwongyeire, P. (2010). Library automation and graduate students' access to information at Makerere University. Unpublished Masters Thesis, Makerere University.

Aviles, M., & Eastman, J. K. (2012). Utilizing technology effectively to improve Millennials' educational performance: An exploratory look at business students' perceptions. *Journal of International Education in Business*, *5*(2), 96-113.

Babu, P. B., & Krishnamurthy, M. (2013). Library automation to resource discovery: a review of emerging challenges. *Electronic Library, The*, *31*(4), 433-451.

Boakye, J. (1999). Users' awareness and use of science and technology collections at the University of Science and Technology (UST) libraries. *Journal of Librarianship and Information Science*, *31*(4), 204-211.

Buhay, D., & Best, L. A. (2014). *Evolution of the University knowledge center: From the Library to the Commons*. Poster presented at the 6th Qualitative and Quantitative Methods in Libraries International Conference, Istanbul, Turkey.

Byrne, U. (August 2013). Achieving Library Refurbishment: Get the most out of matched funding and careful design planning. A paper presented at the satellite meeting of IFLA World Library and Information Congress 2013: Making ends meet: high quality design on a low budget, held 5-16 August 2013 at Li Ka Shing University Library, Singapore Management University, Singapore

Dadzie, P. S. (2005). Electronic resources: access and usage at Ashesi University College. *Campus-Wide Information Systems*, *22*(5), 290-297.

Feldmann, L., Wess, L., & Moothart, T. (2013). An assessment of student satisfaction with a circulating laptop service. *Information Technology and Libraries*, *27*(2), 20-25.

Gardner, S., & Eng, S. (2005). What students want: Generation Y and the changing function of the academic library. *portal: Libraries and the Academy*, *5*(3), 405-420.

Gould, E., & Gomez, R. (2010). New challenges for libraries in the information age: A comparative study of ICT in public libraries in 25 countries. *Information Development*, *26*(2), 166-176.

Holden, H., & Hsieh, M. L. (2007). The state of wireless laptop lending programs: a survey of academic libraries. *Library Hi Tech*, *25*(2), 260-275.

Hsieh, M. L., & Holden, H. (2008). A university library laptop lending service: An analysis using two student surveys. *Library Hi Tech*, *26*(3), 424-439.

Jonas-Dwyer, D., & Pospisil, R. (2004, July 4-7). *The millennial effect: Implications for academic development*. Paper presented at the 27th HERDSA Conference – Transforming Knowledge into Wisdom: Holistic Approaches to Teaching and Learning, Sarawak.

Katz, R. N. (2002). The ICT Infrastructure: A Driver of Change. *EDUCAUSE review*, *37*(4), 50-61.

Kumar, B. S., & Biradar, B. S. (2010). Use of ICT in college libraries in Karnataka, India: a survey. *Program: electronic library and information systems*, *44*(3), 271-282.

Lugya, F., & Mbawaki, I. (2011). *Usability of Makula among Makerere University Library users: a case study*. Paper presented at the 3rd International Conference on Qualitative and Quantitative Methods in Libraries, Athens, Greece.

Manda, P. A. (2005). Electronic resource usage in academic and research institutions in Tanzania. *Information Development*, *21*(4), 269-282.

Massis, B. E. (2011). Information literacy instruction in the library: now more than ever. *New Library World*, *112*(5/6), 274-277.

McMahon, M., & Pospisil, R. (2005). Laptops for a digital lifestyle: Millennial students and wireless mobile technologies. *Proceedings of the Australasian Society for Computers in Learning in Tertiary Education*, 421-431.

Moore, A. C., & Wells, K. A. (2009). Connecting 24/5 to millennials: Providing academic support services from a learning commons. *The Journal of Academic Librarianship*, *35*(1), 75-85.Musoke, M. G. N. (2007, February). *Technology and repackaging enhance information delivery to remote Uganda*. Paper presented at the *FORO conference*, University of Arizona, USA.

Musoke, M. G. N. (2008). Strategies for addressing the university library users' changing needs and practices in Sub-Saharan Africa. *The Journal of Academic Librarianship*, *34*(6), 532-538.

Musoke, M. G. N. (2010). *Reconstruction@maklib with minimal resources*. Paper presented at the IFLA World Library and Information Congress, Gothenburg, Sweden. Retrieved May 30, 2014, from http://www.ifla.org/files/hq/papers/ifla76/106-musoke-en.pdf

Musoke, M., Kakai, M and Akiteng, F. (eds).(2005). *Library automation in East and Southern African Universities*. Proceedings of a Sub-regional Conference, 6-8 June, 2005, Makerere University. Kampala. ISBN:9780-950-01-8880-8.

Musoke, M. G. N. & Kinengyere, A. A. (2008). "Changing strategies to enhance the usage of electronic resources among the academic community in Uganda with particular reference to Makerere University". In: Rosenberg, D (ed): E*valuating electronic resouce programmes and provision: case studies from Africa and Asia*. INASP Research and Education case studies no 3. Oxford: INASP. ISBN:978-1902928-31-9. Ch 6. pp 79-100.

Musoke, M. G. N., & Mwesigwa, A. (2013, May 27-31). *Informing policy and* . Paper presented at the 5th *Qualitative and Quantitative Methods in Libraries International Conference*. Rome, Italy.

Nassali, E. (2001). A proposal to automate the technical services section of Makerere University Library, Uganda. Unpublished Masters Thesis, Makerere University.

Okello-Obura, C. (2000). Software selection for information management systems: a case of Makerere University Library. Unpublished Masters Thesis, Makerere University.

Ramzan, M., & Singh, D. (2009). Status of information technology applications in Pakistani libraries. *Electronic Library, The*, *27*(4), 573-587.

Shaw, S., & Fairhurst, D. (2008). Engaging a new generation of graduates. *Education+ Training*, *50*(5), 366-378.

Tenopir C., Hitchcock B., & Pillow A. (2003). Use and users of electronic library resources: An overview and analysis of recent research studies. Washington, DC: Council on Library and Information Resources.

Thompson, S. (2012). Student Use of Library Computers: Are Desktop Computers Still Relevant in Today's Libraries?. *Information Technology and Libraries*, *31*(4), 20-33.

Tibenderana, P., Ogao, P., Ikoja-Odongo, J., & Wokadala, J. (2010). Measuring levels of end-users' acceptance and use of hybrid library services. *International Journal of Education and Development using ICT*, *6*(2), 33-54.

Troll, D. A. (2002). How and why libraries are changing: what we know and what we need to know. *portal: Libraries and the Academy*, *2*(1), 99-123.

Wakeham, M., & Garfield, D. (2005). Supporting both learning and research in a UK post-1992 university library A case study. *Journal of librarianship and information science*, *37*(4), 175-186.

Appendix

Questionnaire assessing the usage of IT facilities and Services in Makerere University Main Library.

Dear Library user, please fill this short questionnaire to enable the Library to know the usage of IT facilities and services to be able to plan better and improve the services.

1. **Gender:** ☐ Male ☐ Female
2. **College …**
3. **Course (*Please write the course in full)***
4. **Category of respondent (*Please tick only one that best describes you)***

☐ Postgraduate ☐ Undergraduate ☐ External User

5. Are you aware of the presence of the following IT facilities and services in the Library?

- Learning Commons for Undergraduate students
- Research Commons for Postgraduate students and researchers
- Computer lab for Laptop users
- IT support services
- Online Catalogue terminals
- Computer lab for Users with disabilities

6. While in the Library, do you use any of the following? Tick as many as you have used.

- Research Commons for Postgraduate students and researchers
- Learning Commons for Undergraduate students
- Online Catalogue
- Computer lab for Users with disabilities
- Your own Laptop in different parts of the library
- Your own lap top in the Computer lab for Laptop users

7. Do you own a Laptop? ☐ Yes ☐ No

8. If you use your laptop, why do you prefer using your own laptop to the computers in the library?

9. If you use both the computers in the Library/Computer lab and your own laptop, which one do you prefer and why?

a) Preference: ☐ Prefer computers in the library ☐ Prefer own laptop

b) Why? …….

10. (a) What do you use the Library computers/Commons/computer lab for?

- To access electronic resources for my course work
- For general academic reading/updating
- For typesetting my course work
- For checking email
- Other

(b) If you have selected "Other" in the above question, please specify

11. Are you aware that while in the Library, you can access the following services using your laptop and/or smart phone?

☐ Library Online Catalogue ☐ Library website ☐ Electronic resources

12. Comment on IT facilities and services in the Main Library?

13. Any other comments are welcome.