How ICT Impacts the Research Environment

A case study of Makerere University

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Abstract

In 2000 SIDA began a research cooperation with Makerere University in Uganda after it was found to be the centre of research activity in the country. The lack of Information and Communication Technology, ICT, was pointed out as a factor to the weak research and training and by adding the presence of ICT facilities, it was believed that the research environment could be improved drastically.

The purpose of this study was to examine how the usage of ICT at Makerere University in Uganda has impacted the research environment and what role the SIDA funded Directorate of ICT Support, DICTS, has played as well as provide suggestions to how to continue to improve the research environment with the use of ICT.

The ICT resources available to students and staff identified in this study at the university are provided in the form of desktops, laptops, wired and wireless internet, several web-based applications and an e-learning application. Furthermore, the students and staff also use personal phones, smartphones, tablets as well as computers and laptops to communicate, access and interact with the school provided ICT resources. The ICT training given by DICTS has been well received by those who participate but results show that the participants want more sessions and training for themselves and for their fellow colleagues.

Populärvetenskaplig Sammanfattning

År 2000 inledde SIDA ett samarbete med Makerere Universitet i Uganda efter att det bedömdes vara centrum för forskningsaktiviteten i landet. Forskningen ansågs dock vara bristfällig och bristen på informations- och kommunikationsteknik, IKT, pekades ut som en faktor. Genom att öka närvaron av IKT faciliteter trodde man att forskningsmiljön kunde förbättras drastiskt.

Syftet med denna rapport är att undersöka hur användningen av IKT på Makerere Universitetet i Uganda har påverkat forskningsmiljön och vilken roll den SIDA finansierade verksamheten DICTS har spelat såväl som att framföra förslag på hur de kan fortsätta att förbättra forskningsmiljön med hjälp av IKT.

Resultaten visar att de IKT resurser som universitetet erbjuder till anställda och studenter finns i form av bärbara och stationära datorer, trådlöst internet och internet via kabel, ett antal webbaserade applikationer och en e-lärandeplattform. Studenter och anställda använder också telefoner, smarta telefoner och surfplattor för att kommunicera och interagera med universitetets IKT resurser. IKT utbildningen som DICTS har försett universitetet med har tagits väl emot av de som deltagit men resultaten visar att de som deltagit gärna vill ha fler utbildningstillfällen både för sig själva och för sina kollegor.

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Glossary

DICTS – Directorate for ICT Support

E-learning – Electronic Learning

ICDE – International Council for Open and Distance Education

ICT – Information and Communication Technology

ISP – International Science Programme

LAN – Local Area Network

LMS – Learning Management System

MB – Megabyte

MUBS – Makerere University Business School

MUELE – Makerere University E-learning Environment

SAREC – SIDA Department for Research Cooperation

SIDA – Swedish International Development Cooperation Agency

SPIDER – The Swedish Programme for ICT in Developing Regions

TAM –Technology Acceptance Model

TRA – Theory of Reasoned Action

UI – Utrikespolitiska Institutet

UTAUT – Unified Theory of Acceptance and Use of Technology

WAN – Wide Area Network

1. Introduction

In this thesis I will investigate how the usage of information and communication technology, ICT, at Makerere University in Uganda has impacted the learning environment. By looking at the level of acceptability, usability and acceptability of the students and staff at the university this thesis aims to explain effects of ICT as well as suggest what can be done to further improve the environment through ICT. The material for this study was collected between 2014 and 2016, however a larger part of the report was written in 2021. While the data is still relevant the current COVID-19 pandemic has accelerated online learning worldwide as classic classroom education has been disrupted around the world. During March 2020 all learning institutions in Uganda, including Makerere University were closed as a response to the corona virus outbreak (Daily Monitor, 2020). Although students were no longer allowed to attend the classic classroom training, not all studies were halted, some continued and switched over to the e-learning platforms available (ICDE, 2020).

1.1 Background

Makerere University in Kampala is the oldest, biggest, and most renowned university in Uganda (SIDA, 2013). The support of the Swedish International Development Cooperation Agency, SIDA, to Makerere University has contributed to increased internet access, library resources, research infrastructure, increased research and research training capacity in areas relevant for poverty reduction, and strengthened collaboration between academia, government and industry (Swedish Embassy in Kampala, 2012).The department in SIDA that provides assistance for strengthening national research capacity in developing countries is called SIDA's Department for Research Cooperation, SAREC. They believe that it is fundamental for a research institution to have a sound foundation in computers and access to the internet. But in order to be successful this cannot only be limited to research, it has to be integrated throughout the entire university to all its staff and students (Greenberg & Versluis, 2005).

Following an investigation carried out by SIDA about the research situation in Uganda 1999, they found that the centre for research activity was found at Makerere University. Because of this, Makerere University became the focus of the research cooperation between Sweden and Uganda. The result of the investigation revealed that the research and training at Makerere was weak, and the following areas were pointed out as areas contributing to the weakness;

- Lack of scientific literature.
- Lack of information communication technology (ICT).
- Weak administration.
- Lack of funds for those with PhDs to continue to do research.
- The requirements in the university policy of lecturers having PhDs was not coupled with any increased PhD training possibilities.

Adding the presence of ICT facilities was thought to possibly improve the research environment drastically. This was because ICT would make with other researchers easier, scientific literature would be more accessible and administrative routines could be made more effective with the

introduction of ICT (Tusubbira, Mulira, Kahiigi & Kivunike, 2008). So, in 2000 SIDA began its research cooperation with Uganda. The goal with this cooperation was to better the analytical capacity within the research on combating poverty and improving democratic governance at public universities. At the time this report was started the collaboration was in its third phase covering a period from 2010-2014. The total funding was 180 million SEK mainly directed to Makerere University but also to other public universities. The support focuses on research education within medicine, technology, liberal arts and social sciences, agriculture and veterinary medicine. Some of this money was also given to improve the research environment, which includes ICT, libraries, quality assurance and so on (SIDA, 2013).

One of the results of this funding is the Directorate of ICT support (DICTS). DICTS was set up as a central service unit to provide guidance and expert services to all academic and administrative units of the university concerning ICT. DICTS is mainly funded by SIDA but has other national and international sponsors (Tusubbira, Mulira, Kahiigi & Kivunike, 2008). The international science program (ISP) at Uppsala University is responsible for coordinating DICTS, the library and the faculty of science at Makerere University, on the Swedish side (ISP, 2013).

1.2 Purpose of this study

This study aims to investigate advantages and disadvantages of the usage of ICT at Makerere University and how it has impacted the research environment. More specifically what has been good and what has been bad with the development of the ICT environment at Makerere will be studied to understand the impact ICT has made and what can be done to improve the research environment further through ICT.

The following research questions are the ones that I intend to answer in this report:

- How does ICT work in general at Makerere University?
- What is the perceived opinion of the students and staff at Makerere University about the available ICT resources?
- How has ICT affected the research environment at Makerere University and what role has DICTS played?
- How can DICTS with the use of ICT continue to improve and develop the research environment at Makerere University and what challenges will they face?

1.3 Delimitations

This study is limited to one university, Makerere University, because it is the focal point of research collaboration between Sweden and Uganda. Moreover, the study only focuses on the students and staff at the main campus of Makerere University in Kampala, therefore Makerere University Business School, MUBS, Eastern Campus in Jinja and Western Campus in Fort Portal and students conducting their studies on distance are not included.

Because the material for this report was primarily gathered between 2014 and 2016 but the report finalized in 2021 some of the difficulties have included having old web sources and not being able

to find information about the computer availability in later years as Makerere stopped reporting on this subject in their yearly fact book after 2016.

1.4 Thesis overview

After this introduction to this report, I will present the theoretical framework in chapter 2. This is followed by an account of the methods used in chapter 3. Next is chapter 4, where the result is presented. Afterwards an analysis of the material collected is laid out in chapter 5 and finally chapter 6 contains the concluding discussions for this report.

2. Theoretical framework

This chapter provides a definition of the concept ICT and its use in education as well as a review of previous research in the area. To answer the research questions, theories from human computer interaction and more specifically theories concerning accessibility, usability and acceptability will be used. They are introduced and explained in this chapter.

2.1 Information and Communication Technology, ICT

Information and communication technology (ICT) is defined as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information" (Blurton, 1999, p 1). This includes computers, internet and smartphones as well as radios and televisions, all the applications associated with these and many more (Blurton, 1999). All these tools have been said to be potential enablers for education change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace and raise educational quality. One of the ways in which the ICT tools the ICT tools can help is by making teaching and learning into an engaging, active process connected to real life (Tinio, 2002). As information and communication are the key factors in the education process the use of different ICTs in education has a long history. Moreover, the ICT use in education can be expected to increase as the access to digital tools, applications and networks continues to grow worldwide and media are increasingly available in digital form (Blurton, 1999).

2.1.1 ICT in education

There are many ways of which ICT can be incorporated into studies and used as tools to support the learning process.

There is e-learning, which is learning using wholly or in part using an information network whether it be internet, intranet (LAN) or extranet (WAN) for interaction, course delivery, and/or facilitation. Online learning or web-based learning using an internet browser is a subset of e-learning (Tinio, 2002).

Blended learning is a term which is used to describe learning models that combine traditional classroom practice combined with e-learning solutions. For instance, combining print-based and online material or having mentoring sessions through chat and video conference combined with face-to-face sessions (Tinio, 2002).

Open and distance learning is a way of providing learning opportunities, characterized by the separation of teacher and learner in time or place, or both time and place. In this form a variety of media is used in the learning process including print and electronic, two-way communications that allows for the interaction between learners and tutors the possibility of face-to-face meetings (Tinio, 2002).

Past experiences over the last decades from introducing different ICTs into educational systems globally show that it is a complex process that involves more than just technology. The advantages of introducing a new ICT do not come automatically. Institutions must combine the work of

integrating the ICTs with working on their curriculum and their pedagogy. Other crucial factors are institutional readiness, teacher competencies and long-term financing (Pannu & Tomar, 2010).

2.1.2 ICT in Uganda

The challenges that Uganda face while trying to integrate ICT in education are many, and they are similar to many of the challenges other developing countries face. High bandwidth costs, poorly developed ICT infrastructure, an unreliable electric supply and a lack of sufficient resources to meet a wide range of needs are some of them (Farrell, 2007). Sometimes technology is just not an appropriate solution in the first place, projects may be implemented in a bad way, equipment may be used in an improper way, there could be a lack of follow-up, stakeholders may not receive sufficient training to support the program, or it may be difficult to create and sustain a project within a shifting social and political context (Wells & Wells, 2007). The strengths lie in the rapid development of wireless network capacity and the growing presence of mobile phones in the country which allows for a strong communication structure, although different from the one we have seen in developing countries (Farrell, 2007).

2.1.3 ICT in Makerere University

In an evaluation made by SIDA in 2005 it is stated that Makerere University has benefited from the different ICT technologies. The impact varies between faculties, but the main improvements include more efficiency in administrative tasks and more collaboration between researches (Greenberg & Versluis, 2005).

2.2 Accessibility

Accessibility is defined by the standard ISO 9241:2017 as the "extent to which products, systems, services environments and facilities can be used by people from a population with the widest range of user needs, characteristics and capabilities to achieve a specified goal in a specified context of use" (ISO, 2017) and deals with overcoming different types of barriers that could possibly exclude some people from using the system. These barriers can be physical, conceptual, economic, cultural or social and it is crucial that all types of possible users are considered in the design process. Inclusive design and universal design, also known as design for all, are the two main approaches to designing accessible systems. A good design is one which has considered access issues for all types of users in an early phase. This means that they include people with special needs in all phases of the development, considering how new features may affect these types of users. This type of design will be better for everyone at the end of the day (Benyon, 2010).

2.3 Usability

ISO (2018) defines usability as:" the extent to which a system, product or service can be used by specified users to achieve specific goals with effectiveness, efficiency and satisfaction in a specific context of use". According to Benyon (2010) usability is defined as the property of systems that are easily used, easily learned and systems that are flexible and should bring forth a good attitude in people. Two main goals of usability are *efficiency* and *effectiveness*. Furthermore, usability can be

described in terms of the quality of the interaction with a system, measured in terms of the number of errors made, the time taken to perform tasks in the system or the time it takes to become a competent user.

A usable system allows people to do things in it using an appropriate amount of effort and it contains the appropriate functions and information content organized in an appropriate manner. A usable system is easily learnt and easily remembered and is safe to operate in the variety of contexts in which it will be used and lastly it will have high utility in that it does the things that people want to get done. In order to achieve usability in a system, the designers have to take to a user-centred approach and to adopt a design approach in which evaluation is central (Benyon, 2010).

2.4 Acceptability

While there is no ISO standard definition for acceptability, it is defined as "the quality of being satisfactory and able to be agreed to or approved of." (Cambridge University Press, 2020). Acceptability can only be understood in the context of use and has to do with fitting technologies into peoples' lives (Benyon, 2010). According to Davis (1989) there is an associated risk with organizational investments in computer-based tools that support planning, decision making and communication processes and understanding why people accept or reject information systems have been proved to be difficult. The Technology Acceptance Model (TAM) from 1989 (Davis) explains how users come to accept and use a technology. It is an adoption of a previous model from social psychology, the Theory of Reasoned Action (TRA). The TAM meant to specifically explain information systems, and at the time computers usage behaviour.

There are several theories attempting to explain the user acceptance and by choosing just one, other factors which may be important could be missed. Venkatesh (2003) saw this as a problem and noted the need for a unified view of user acceptance and created a model which combines the eight most prominent theories in user acceptance (Venkatesh, 2003).
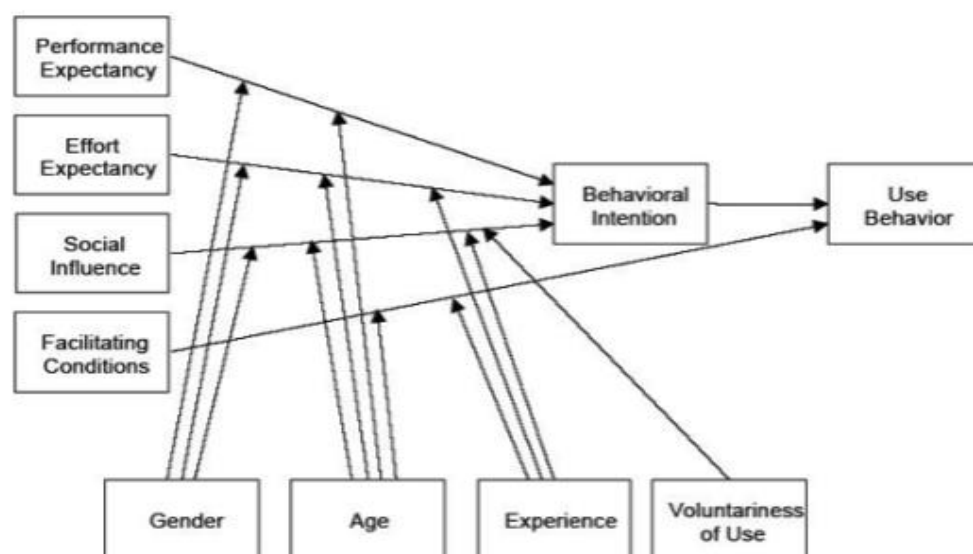

Figure 1. Unified Theory of Acceptance and Use of Technology, UTAUT (Venkatesh, 2003)

In this model four key factors were pointed out to determine to which degree a new technology would be accepted. These are performance expectancy, effort expectancy, social influence and facilitation conditions and are pictured to the left in the model. In addition to these four factors there are four parameters that combined with the factors affect the behavioural intention and use behaviour, these are gender, age, experience and voluntariness of use. Performance expectancy refers to the degree to which a person believes that using a specific system would increase their job performance. Gender and age will affect the behavioural intention in a way that the effect is stronger for men and especially for men of a younger age. Effort expectancy refers to the degree to which a person expects the specific system to be free of effort. Gender, age and experience will affect the behavioural intention in a way that the effect is stronger for women, especially younger women and especially at early stages of experience. Social influence refers to the degree in which important people such as fellow workmates or family or friends believe that the system should be used. Gender, age, experience and voluntariness will affect the behavioural intention in a way that the effect will be stronger for women, especially for older women and especially in mandatory settings in the early stages of experience. Facilitation conditions refer to the degree to which an individual believes that organizational and technical infrastructures exist to support the use of the system. This will not have a significant influence on behavioural intention however age and experience will affect the use behaviour in a way that the effect will be stronger for older people, especially with increasing experience. An illustration of the model can be seen above in figure 1 (Venkatesh, 2003).

3. Methodology

To carry out this investigation, a combination of qualitative and quantitative methods of gathering information were used. This chapter proceeds to explain the different methods and how they were used as well as their advantages and disadvantages.

3.1 Literature study

Literature about ICT and its impact and influence on education and research and especially the available literature from SIDA and others connected to Uganda and DICTS have been reviewed for this study. This has provided a relevant background about the topic. Literature concerning human computer interaction was also reviewed.

3.2 Conducting the investigation as a Minor Field Study

This project was carried out as a minor field study at Makerere University in Uganda. A minor field study scholarship is a grant from SIDA that is granted to students who intend to carry out smaller field studies for their bachelor's or master's thesis in what SIDA considers a developing country during a period of at least 8 weeks (Programkontoret, 2014). The field work took place from April to June 2014 although a second questionnaire and complementary interviews were added in January 2016.

3.3 Interviews

Interviews are one of the most effective ways to find out what people want and what problems they seem to have at a given moment. Interviews are usually categorized into structured, semi-structured and unstructured interviews. A structured interview has pre-prepared questions, and these are followed exactly during the interview. In a semi-structured interview, there are pre-prepared questions that can be altered during the interview which gives the interviewer a chance to explore new topics as they arise as well as giving the interviewer an opportunity to further investigate things that will be interesting for the study. An unstructured interview is usually used when little information is available beforehand and in this type of interview no questions are prepared in advance (Benyon, 2010).

In this study semi-structured interviews were used. When I interviewed students, I used group interviews as well as individual interviews and when I interviewed staff, they were individual. The pre-prepared questions for the interviews carried out can be found in Appendix A. Two different guides were used, one aimed for staff like lecturers, and managers and one was used for the students. Most interviews were recorded, and the information recorded about them were their gender, college and for students how far along in their studies they were and for staff their role at the university.

Makerere has divided its staff into three broad categories; teaching, administrative and support staff. The total headcount according to the Makerere Fact Book 2014 comes to 3506 employees and the teaching staff accounts for 1380 of them. Table 1 shows the three categories of the staff. (Makerere

University, 2014) The interviews with staff at Makerere University included support staff from DICTS and teaching and administrative staff from the University.

Table 1. Academic staff at Makerere University 2014

Academic staff group	Number of staff
Teaching staff	1380
Administrative staff	368
Support staff	1758
Total	3506

In January 2014, the university had 37000 registered students where undergraduates are roughly 34 000, master students 2000 and the rest PHD students, diploma students and post graduate diploma students. Table 2 below shows exact figures for the different student groups. (Makerere University, 2014).

Table 2. Students at Makerere University 2014

Student group	Number of students
Undergraduate students	34 629
Graduate students	2506
Others (Diploma, PhD etc)	-
Total	37 135

Finally, table 3 below gives a presentation of the subjects that were interviewed in this study.

Table 3. Presentation of the interviewees

Interviewee	Background	Date of interview	Group/individual
Student A	3rd year Ba Sc Industrial Chemistry	2014-05-27	
Student B	3rd year Ba Sc Industrial Chemistry	2014-05-27	Group 1
Student C	3rd year Ba Sc software engineering	2014-05-27	
Student D	2nd year Ba Sc Industrial Chemistry	2014-05-27	
Student E	2nd year Ba Sc Industrial Chemistry	2014-05-27	Group 2
Student F	4th year Ma ScCHUSS (M)	2016-01-12	Individual
Student G	4th year Ma Sc CHUSS	2016-01-13	Individual
Lecturer A	PhD Chemistry, teaching at Makerere since 1999	2014-05-28	Individual
Lecturer B	Ma Sc Physics,	2014-05-28	Individual
Manager A	Working with DICTS	2014-06-02	Individual

3.4 Questionnaire

A questionnaire is useful in order to obtain information from a larger number of people. It does not leave room for follow-up questions, however it does if carried out correctly, give you data that can easily be quantified. Using different types of rating scales is the common way to collect the perceptions of the users. It is also better to use specific questions rather than using general ones. The difference between these is that the respondent is given a set of options as opposed to being free to write whatever they want. This reduces the risk of misunderstanding and gives quantifiable answers. In a questionnaire it is also better to use closed questions instead of open ones. The difference between them are that closed questions minimizes differences in interpretation, it is also important to leave room for a no opinion/don't know field in order for the questionnaire, otherwise the results can be manipulated because respondents manufacture an opinion for the questionnaire. Varying the rating scales, having a good overall design and some introductory and concluding notes are also essential for the respondents to want to fill it out (Benyon, 2010).

The Likert scale was used for many of the questions, and I also left room for the respondents to leave related comments. The form was created with the online tool Google Forms. The questions for the questionnaire can be found in Appendix B and E. The result can be found in Appendix C, D, F and G.

3.4.1 Staff questionnaire carried out 2014

This questionnaire targeted employees at the university. The questionnaire was sent out by a manager at DICTS to the responsible public relations managers at each college urging them to tell their staff to respond to the questionnaire. This was done because DICTS had previously tried to conduct online questionnaires but failed to get people to participate. So, this new strategy was tried and the support of DICTS was thought to increase participation. In an attempt to get more participants printed versions were handed out to most colleges on campus. The interest in filling out online or printed questionnaires was low. Many never responded and due to lack of time and interests never responded to the questionnaire. Table 4 shows which groups the different participants belonged to.

Table 4. Questionnaire participation

University group	Total responses
Lecturers	11
Administrators	10
Staff	2
Total	23

3.4.2 Student questionnaire carried out 2016

This questionnaire targeted students at the university. The questionnaire was handed out by the author on the main campus around the main building and library. Table 5 shows which groups the different participants belonged to.

Table 5. Student questionnaire 2016

Student group	Total responses
1-3 years	38
4 or more	17
Other	1
Total	56

3.5 Observation

Observation is used to get information out of a group by observing them and documenting the behaviour of the group, conversations between the individuals in the group and conversations between individuals in the group and the observer. This method is usually complemented with

additional methods of gathering information such as interviews. Gaining access to an environment can be difficult and in order to avoid explaining or asking permission to access a place the identity of the observer can be hidden to the group. Usually this is not needed in an open public environment. An observer can take on different roles relating to the degree of involvement the observer has to the social environment and the people included in it. Gold's classification scheme from 1958, shown in figure 2 below, presents the different roles that can be adopted.
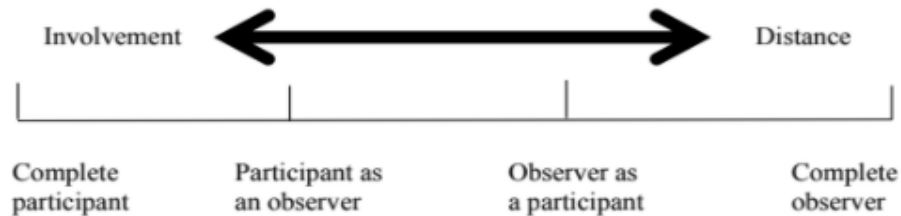
Figure 2. Golds classification scheme (Bryman, 2009)

The complete participant's identity is unknown to the other people in the group and this person is viewed as just another member of the group. A participant as an observer engages with the group as though they are members, but the others are aware of the fact that they are an observer. An observer as a participant is more like an interviewer. In this role, the observer only has minimal involvement in the social setting being studied. There is some connection to the setting, but the observer is not naturally and normally part of the social setting. A complete observer does not interact with the group and the group does not take the presence of the observer into account when they are carrying out their activities (Bryman, 2009).

The observation method was used during sensitization workshops that were carried out by DICTS at the university. Makerere University is an open public environment, and I was presented as a student conducting a study at each workshop, so the attendees were fully aware of the identity and purpose of the observer. Furthermore, I took on the role of an observer as a participant, the third role in Gold's classification. Table 6 presents the workshops which I attended during my time at Makerere University.

Table 6. DICTS ICT Sensitization workshops

College	Number of staff	Number of attending	Date of sensitization
College of Business and Management Science (CoBams)	111	15	2014-04-23
College of Veterinary Medicine Animal Resources and Bio-Security (CoVAB)	95	17	2014-04-30
College of Natural Science (CoNaS)	151	10	2014-05-14
Total	357	42	-

(Makerere University, 2014; Mugenyi, 2014).

3.6 Methodology discussion

Several methods were used to gather the material in this study. Interviews, questionnaires as well as observing was chosen because it was thought to capture different aspects of people's experiences.

This approach also gives the author a chance to get a wider understanding as opposed to a deep dive about the topics investigated. By interviewing and observing staff from DICTS as well as teachers and students at Makerere, a user perspective

I will try to gain a user perspective. This will help me understand what part ICT has played in their daily tasks. Combining these methods will help me find areas of improvement within the current ICT facilities at Makerere University.

The people in the interviews were all made anonymous so they would feel free to express opinions without any fear of backlash. Although the author realizes that this makes the study less transparent. To make sure it was still as transparent as possible most interviews were recorded.

The number of participants in the survey were satisfying for the study and captured both men and women from different colleges as well as different stages of their academic journey. By conducting a survey amongst the different student groups, I was be able to understand the impact ICT has made on the university and if it has reached out to the different student groups.

The first survey was distributed online, and the author realized that it was hard to get responses despite being sent to a wider audience. The second survey was therefore printed and handed out to students. This also proved efficient as the author could answer and clarify any questions the respondents might have had and to avoid misunderstandings.

The author took on a role as an observer as a participant in the three sensitization sessions and doing so proved effective in capturing the reactions and feedback from the group.

Many web sources were used for this report while most are still accessible today some sources are no longer available online.

The material gathered was mainly collected in 2014 and 2016 while the report has been finalized in 2021. In the current climate this study would not have been possible to re-create as there are restrictions in place in most places in the world prohibiting people from gathering.

4. Results

This chapter describes the how ICT is used in Makerere University and is divided into two sections. The available resources and the training available to students and staff.

4.1 Available ICT resources at Makerere

This section aims to describe how ICT works in general by describing the different types of ICT resources available at Makerere University.

4.1.1 Computer and internet access

In 2013 there were 5301 computers available in computer labs and kiosks to serve Makerere's population of almost 40 000 students, which gives a ratio of one computer to every seven students. Since the colleges are semiautonomous this ratio varies from college to college and so does the quality of the computers. Many are outdated and in need of upgrades. Table 7 below shows computer facilities at the different colleges Makerere (Makerere University, 2014).

Table 7. Computer facilities at Makerere University (2014)

Computer facilities by colleges	Number of computers	Number of students	Student-Computer Ratio
Agricultural & Environmental Sciences	379	2261	6
Business and Management Sciences	190	6241	33
Computing & Information Sciences	2035	5916	3
Education & External Studies	247	6458	26
Engineering, Design, Art & Technology	381	3204	8
Health Sciences	701	1524	2
Humanities & Social Sciences	440	8436	19
Natural Sciences	100	1207	12
Vet. Medicine, Animal Resources & Bio-Security	150	568	4
School of Law	90	1318	15
University Library	-	393	-
Kiosks (DICTS) Offices	-	115	-
Total	5301	37133	7

The internet kiosks are unlike the computer labs located near the student halls of residence. Equipped with desktops and wired connections for free access for students to internet and computers. In 2011 (Ndawula) there were eight kiosks available and they were run by the students

on behalf of the university. They were free for students and a valid student ID had to be presented in order to use them.

Makerere launched free wireless hotspots called MAKair around the campus for their students in 2010. The hotspots are located strategically so that students are able to work at any time of the day or night when bandwidth is generally more available (Wamala, 2010).

The survey showed that 90% of the employees used computers approximately half of the day or more and that all of the people asked had access to either a computer to conduct their work. 22% were not satisfied with the internet at their college, 44% were OK and 35% were satisfied (Survey, 2014).

46% of the students agreed or strongly agreed to the statement that the ICT resources at Makerere were generally good, when asked about the resources at their own college that number was 32%. 54% of the students agreed or strongly agreed to the statement that the internet availability was generally good (Survey, 2016).

Some of the comments from the survey regarding the ICT resources in Makerere were that the computer availability in colleges should be increased, however, multiple students commented that they were satisfied with the ICT resources in the main library. There were also comments about adding sockets for students to plug in their computers for electricity. Some comments about the internet were that the Wi-Fi should be made available throughout the campus. Some also suggested that network cables should be provided to connect to the internet as an alternative to the wireless and to remove the current restrictions on accessing YouTube as well as making the wireless more stable, improve network capacity and speed.

Summary of comments made about the available ICT resources:

- Computer availability in colleges should be increased.
- ICT Library resources are good.
- More sockets to plug in personal laptops for electricity.
- Enable students to improve their class performance through research.
- They are essential to my academic work.

Summary of comments made about the internet availability:

- Wi-Fi Should be made available throughout the campus.
- Provide network cables to plug in personal laptops.
- Take away restrictions on YouTube.
- Should be more stable, improve network capacity and speed.

4.1.2 Personal ICT resources

Students and teachers also use personal equipment to access and interact with the university provided ICT resources. Among the teachers and staff that used a laptop to carry out their work 48% answered that they used a personal laptop and 9% answered that they used a school provided

laptop in the survey carried out in 2014. When asked about desktops 26 % stated that they used a personal desktop to carry out their work and 43 % used a desktop provided by the school.

In the survey given out to students in 2016 67 % answered that they used a personal laptop or desktop. The most common answer around how they interact with the ICT resources among the students were personal laptops at 80 %. 30 % of the students in the survey used personal desktop compared to 33 % that used public or school provided desktops.

4.1.3 E-learning at Makerere

The initiative for creating an e-learning environment at Makerere came in 2000 and by 2002 it was decided to start the project of establishing such a system. The project was delayed and not until 2007 was there a functioning e-learning environment (Tusubbira, Mulira, Kahiigi & Kivunike, 2008).

The e-learning management system which is used today at Makerere is called Makerere University E-learning Environment MUELE and is based on the open software Moodle. By 2014 the platform was fully accessible on desktops and laptops but not yet suitable to use on all mobile phones. This was because the system was heavy and has a number of features which require adjustment and reworking to enable it usable on these kinds of mobile devices. However, there was an ongoing investigation in collaboration with SPIDER to investigate what needs to be done to adapt the system to the mobile devices (SPIDER, 2014).

In the annual report for Makerere 2012, 456 courses from the Colleges of Computing and Information Sciences, Engineering Design Art and Technology, Natural Sciences and Humanities & Social Sciences had been uploaded to the MUELE platform where 283 where from the Colleges of Computing and Information Sciences, (Makerere University, 2013). In 2018 that number was 777, and 327 were from the Colleges of Computing and Information Sciences (Makerere University, 2019)

When asked the 70% of the employees believed they will use MUELE in the near future.

29% of the students asked in the survey had used MUELE and out of those 62% agreed or strongly agreed to the statement that the tool is essential to their academic work. 56% answered or strongly agreed that they found the tool easy to use and 50% agreed or strongly agreed that they liked using MUELE.

Some students commented that all courses should be available on the platform and that all lectures should be recorded and made available there. One student found it useful and characterized the application as user friendly.

Summary of comments made about MUELE

- MUELE is useful and user friendly.
- All courses should be available on MUELE.
- All lectures should be recorded an uploaded to MUELE.
- MUELE saves time as no hard copies are needed and all files can be found in one place.

- Limitations on size of uploads of 100mb should allow exceptions.

4.1.4 Other web–based applications

There are a number of web-based applications at the university and they are mainly meant for staff use but some are also used by and made for students. These are all administered and run by the staff at DICTS, with the exception of the e-learning platform MUELE which is run by staff at College of Education & External Studies. A list of the applications available and their target group can be found in Appendix H.

When asked about the future use of these applications, the table below show how many out of the 23 participants that intended to use the application in the near future.

Table 8. Number of users with intention of using the application in the near future

Web application	Website	Number users in the near future
Document management system	docs.mak.ac.ug	20
Staff forums	forum.mak.ac.ug	18
Staff websites	staff.mak.ac.ug	17
E-learning platform	muele.mak.ac.ug	16
Staff directory	diectory.mac.ac.ug	15
Makerere events	events.mak.ac.ug	14
Staff blogs	blogs.mak.ac.ug	13
Institutional repository	makir.mak.ac.ug	13
Knowledge base	answers.mak.ac.ug	13
MIT Open Courseware	ocw.mak.ac.ug	11
Thesis and project tracking	trackinggradtrack.mak.ac.ug	11

4.2 ICT training at Makerere

Makerere University has established a central service unit for providing services and guidance on ICT to the entire university community. This service unit is the directorate for ICT support, or DICTS. By customer- oriented quality management, control and maintenance processes they want to make sure that there is high and sustainable availability of ICT resources. They work towards bettering the position of Makerere University as a centre of academic excellence, and its contribution to the sustainable development of society by university-wide access to, and utilization of ICT (DICTS, 2020). DICTS is only responsible for central systems like network, web and e-mail

services as well as administrative systems at Makerere University. The responsibility for maintaining and establishing facilities within the faculties as well as working with the end users lies with the faculties (Greenberg & Versluis, 2005).

4.2.1 ICT Workshops

In 2014 DICTS was working on a sensitization project where they were informing the university community on the available ICT resources. The goal of the project was to ensure that people knew what they needed to know about the available ICT resources so that they can get the best of the resources available. They also wanted to inform the users about the optimal query handling processes carried out by them and the various unit administrators. And finally, they wanted to give them a chance to get all their ICT related questions answered or addressed and offer their help and guidance to possible ICT related issues (Makerere University, 2014).

The end-user team at DICTS were in charge of this sensitization which was a 4-hour workshop held at each of Makerere's colleges. They had a program which they aimed to follow at each event. The program can be found in Appendix I and begins with an introduction of DICTS and their current projects followed by a step-by-step description of most of the web-based applications administered by DICTS. The program continues with an introduction to available cloud-based services. After this way to improve the PC environment is discussed and finally, they address network access control, an ongoing project to strengthen the security, as well as information about the available antivirus programs and information about MUELE, the e-learning platform. During the three sensitizations I attended the program was used as a basis to carry out the presentations. Due to participant involvement, technical issues, staff issues and so the times were not always exact, but all of the parts were covered. Each presentation had its own PowerPoint presentation deck to cover the important task to be covered and whenever possible they would carry out demonstrations to show the attendants how to complete a certain task encouraging them to follow the steps as they watched (Mugenyi, 2014).

College of Business and Management Science – CoBams

This sensitization was held in the conference room at the college and 15 people attended. Four members from the DICTS team were there to present and the workshop started around one hour later because the team at DICTS wanted to wait for as many attendants as possible before beginning (Mugenyi, 2014).

In this sensitization the communication between DICTS and the college was brought up. Some of the people attending expressed that they thought that the timing of the sensitization was bad. They would have preferred that it not be in the beginning or end of the semester as their schedules are usually very busy. Another participant also expressed that it took a long time to get responses from the DICTS team. DICTS informed the participants about how the colleges are responsible for their own ICT resources when it comes to purchasing and maintaining them and DICTS should be consulted after consulting the system or network administrator within the college (Mugenyi,2014).

This workshop had many people involved and the issues raised by the attending were the lack of space in the email. This was seen as a big issue by the participants and DICTS tried to explain how they were working on it (Mugenyi,2014).

College of Veterinary Medicine Animal Resources and Bio-Security – CoVab

This sensitization was held in the principal's conference room in the college and 17 people attended. Four of the DICTS staff presented the sensitization was delayed because of technical issues. They were waiting for a projector to arrive and as they waited, the DICTS staff opened up a discussion about their specific needs and issues at the college. The staff at the college expressed that they had a problem with an optical fibre cable and DICTS explained how they could help. The participants also expressed that MAKair coverage in their college was not sufficient as they were located at the far end of the campus (Mugenyi,2014).

College of Natural Science – CoNas

This sensitization began with 10 staff members attending and in the end six remained as some left because they said they had other obligations. There were three staff members from DICTS present for this sensitization. This session was held in a new computer lab unlike the previous ones, and this eased for the participants to be more involved as many of them were doing the things that were demonstrated. The issues that were brought up in this workshop was that many of the senior staff did not know of all the electronic journals they actually had access to. People were very active in this sensitization, many people asked questions about the different issues and at one point one of the attending people were filming a process demonstrated by one of the DICTS team members (Mugenyi. 2014).

The comments regarding the sensitization were, e.g., "*they were good*", "*they should be done more often so that people who missed could attend*" and that "*they were useful and should be made mandatory*". One participant commented that the language used was not suitable for the normal computer user and that it was too complicated. In the survey, when asked to rank the ICT sensitization sessions, roughly 70 % ranked the sessions as very useful (Mugenyi, 2014).

Summary of comments made about the training provided by DICTS:

- It was good.
- The time was not enough.
- Administrators and secretaries should be invited too.
- It was useful.
- It should be done frequently.
- It should be mandatory.
- It should be less technical.

5. Analysis

To answer the first research question about how ICT works in general at Makerere University the available resources have been identified. The ICT resources available to students and staff that have been found in this study at the university are provided in the form of desktops, laptops, wired and wireless internet, a number of web-based applications and an e-learning application. Furthermore, the students and teachers also use personal phones and smartphones, tablets, computers and laptops to communicate and access and interact with the school provided ICT resources.

The second research question addressing the perceived opinion regarding ICT among staff and students at Makerere is analysed by using the concepts accessibility, usability and acceptability to categorize the collected opinions.

There were some barriers identified for accessing and using the available ICT systems at Makerere from an accessibility perspective. The lack of electrical sockets for charging laptops, access points for Wi-Fi as well as ethernet cables for accessing internet where there is no Wi-Fi, available computers and computer labs were some of the physical ones. MUELE's availability on mobile devices and the 100 MB file size upload limit were also pointed out.

From a usability standpoint more than half of the users who answered that they had used MUELE also said that they found it easy to use. Many of the users were positively tuned to the ICT resources available at the university. The respondents were asked about the internet, the ICT resources and the e-learning platform MUELE.

The comments from the people in this study regarding effectiveness were about the speed of the internet, the availability of internet around campus and accessing MUELE after a long time of inactiveness. The students and staff would want faster internet speeds, more access points as well as a smoother process for logging back into MUELE after a longer period of time.

The comments from the people in this study regarding efficiency show that with a tool like MUELE the academic work is made easier as all the material for a course can be found in one placed as opposed to having to search multiple locations as well as getting hard copies of course material can be avoided. The opinion among the students and the staff are that the ICT tools available are essential to their academic work.

The perceived opinion about the satisfaction is that half of the people who had used MUELE responded that they like MUELE.

From an acceptability standpoint the parameters gender, age, experience and voluntariness of use are difficult to address with the material in this study. However, the results from the study show that many believe MUELE is essential to their academic work. This is a sign of performance expectancy. Many respondents also answered that all courses should be made available on the platform and that they believe they will be using the system in the near future which is a sign of social influence. The attitudes of the respondents indicate that there is a need and want for more training and sensitization and this is an example of organizational infrastructure to support the use of the ICT resources, a facilitating condition.

The third research question evaluates how ICT has affected the research environment at Makerere University and the role DICTS has played. As the central service unit that provide guidance and expert services to all academic and administrative units of the university concerning ICT, DICTS has played an important role. The training they have given has been well received and the majority of the attendees characterised the sessions as very useful in the survey.

The final research question examines how DICTS with the use of ICT can continue to improve and develop the research environment at Makerere University and what challenges will they face. In Makerere University, the areas of improvement identified to make the ICT resources more accessible were:

- Adding access points for the Wi-Fi.
- Providing ethernet cables.
- Adding sockets for charging.
- Make web applications available on mobile phones and smartphones.
- Adding more computers and computer labs.

to make the ICT resources more usable:
- Improve internet speeds.

to make the ICT resources more acceptable:

- More training for students and staff.

6. Concluding discussions

As Blurton (1999) wrote, the use of ICT is expected to grow and has done so with time as well as with the global pandemic. Technology has evolved since the information for this study was gathered and today it is easier to access the available ICT resources with more affordable and powerful hardware laptops and smart phones. But even on the software side there have been some significant changes, free software, like google docs, sheets and slides compared to licenced software like Microsoft Office that was the primary word editing tool at the time the study was made has made writing, collaborating and documenting easier for students and staff. Storage on cloud instead of physical hard drives or USB memory sticks is also something that has changed over the last years. With the current pandemic universities worldwide including Makerere have been forced to use the existing platforms to make their courses available to their students.

Because of the delay from when the information was gathered to when the report was finalized, some of the findings here might not be relevant for Makerere University today as the ICT environment has changed over the last couple of years. This also shows that ICT is not stagnant, it will continue to change even in the future and these kinds of studies will have to be done again in order to identify how a learning institution can adapt to the current ICT environment and tools available. However, I believe that some of the findings can be applicable on other learning institutions that have not come as far as Makerere University in their ICT journey. I do see that other learning institutions facing similar challenges may find value in these findings.

6.1 Reflective discussion

Conducting a thesis on my own in another environment proved challenging. Although I left Sweden with a plan and an idea of what I was going to achieve during my time away, it took a lot longer than I expected or planned to finalize. In Kampala I was able to use DICTS offices on the main campus which meant I had access to internet during the days but where I stayed, I did not have the same resources. Internet and sometimes electricity were not stable at that time and either or both would disappear at times. This was not my first time in Uganda, so I had experienced this before, however, not as a student.

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Appendix A – Interview guide (2014 & 2016)

Basic

What is your name

What is your email

College

Age

Background information

1. What are you studying/teaching?
2. What is your background with computer use

Information about computer use

1. Tell me about a normal day at the office / school
2. How do you think the computer use works in your department?
3. Which systems/programs do you use in order to completet your work ie word editors, cloud services, specific subjects
4. Is there anything good or bad with the systems that you use?
5. How has it affected your department?
6. Is there anything you would want to improve?

In research? Qualitative/quantitative,
programs for summarizing data/compile /put together data

Which search engines? Google? Google Scholar? E journals/e-magazine,e boooks

Do you have anyone knowledgable to turn to for help

Information about E-learning (MUELE)

1. Tell me about your experience with the system
2. Is there anything good/bad about it?
3. Is it easy/hard for you to use?
4. Do you use the computer at school/home?
5. How are your experiences?
6. What do you think about the MUELE?
7. Do you find it useful?
8. Any other comments...

Appendix B – Staff questionnaire 2014

DICTS ICT sensitization follow-up survey
This is a Makerere DICTS survey form for monitoring quality of service from your perspective. This form is anonymous and your answers will be used as a basis to map out the current perceived ICT-experience at Makerere University.

* *Mandatory question*
O *Single answer question*
□ *Multiple choice question*

<u>Your profession</u>
What do you do at the university?*
- ○ Lecturer
- ○ Administrator
- ○ Student
- ○ Other: _____

Which college do you belong to?*
- ○ College of Agricultural and Environmental Sciences
- ○ College of Business and Management Sciences
- ○ College of Computing and Information Sciences
- ○ College of Education and External Studies
- ○ College of Engineering, Design, Art and Technology
- ○ College of Health Sciences
- ○ College of Humanities and Social Sciences
- ○ College of Natural Sciences
- ○ College of Veterinary Medicine, Animal Resources & Bio-security
- ○ Dean of Students
- ○ School of Law
- ○ Other: ___

<u>Computer Use</u>
How much of your time do you spend using a computer/phone/tablet in your work?*
- ○ None / Almost none
- ○ Smaller part of the day
- ○ Approximately half of the day
- ○ Almost all day
- ○ Not applicable/ don't know

Which of these do you use in order to complete your work?
- □ Smartphone
- □ Personal laptop
- □ School/work/public laptop
- □ Personal Desktop/PC
- □ School/work/public Desktop/PC
- □ Tablet

Which operating system are you using?
- ○ Windows 8
- ○ Windows 7
- ○ Windows Vista
- ○ Windows XP
- ○ Windows (not sure which version)
- ○ Mac OS

- ○ Ubuntu
- ○ Linux
- ○ Other:_____

Internet
Are you satisfied with the internet at your college/unit?

                 1   2   3   4   5

Not satisfied at all O O O O O Very satisfied

Web-based applications

What do you think of these web-based applications?*

	Very good	Good	OK	Bad	Very bad	I don't use it	never heard of it
ocw.mak.ac.ug (MIT open courseware)	O	O	O	O	O	O	O
staff.mak.ac.ug (staff websites)	O	O	O	O	O	O	O
forum.mak.ac.ug (staff forums)	O	O	O	O	O	O	O
blogs.mak.ac.ug (staff blogs)	O	O	O	O	O	O	O
makir.mak.ac.ug (Institutional repository)	O	O	O	O	O	O	O
muele.mak.ac.ug (online learning platform)	O	O	O	O	O	O	O
directory.mak.ac.ug (staff directory)	O	O	O	O	O	O	O
answers.mak.ac.ug (ICT knowledge base)	O	O	O	O	O	O	O
gradtrack.mak.ac.ug (thesis and project tracking)	O	O	O	O	O	O	O
events.mak.ac.ug (Makerere events)	O	O	O	O	O	O	O
docs.mak.ac.ug (database for documents)	O	O	O	O	O	O	O
viruscheck.mak.ac.ug (SOPHOS antivirus)	O	O	O	O	O	O	O
webmail.mak.ac.ug (makerere web-mail)	O	O	O	O	O	O	O
intranet.mak.ac.ug (Makerere intranet)	O	O	O	O	O	O	O

Do you think that you will use any of these in the near future?
- ☐ ocw.mak.ac.ug (MOOC tool, MIT open courseware)
- ☐ staff.mak.ac.ug (staff websites)
- ☐ forum.mak.ac.ug (staff forums)
- ☐ blogs.mak.ac.ug (staff blogs)
- ☐ makir.mak.ac.ug (Institutional repository/submissions etc.)
- ☐ muele.mak.ac.ug (online learning platform)diectory.mac.ac.ug (staff directory)
- ☐ diectory.mac.ac.ug (staff direc
- ☐ answers.mak.ac.ug (knowledge base)
- ☐ gradtrack.mak.ac.ug (thesis and project tracking)
- ☐ events.mak.ac.ug (Makerere events)
- ☐ docs.mak.ac.ug (database for documents)

Web-Mail*
Do you know how to configure your web-mail with a mail client(Mozilla Thunderbird, Microsoft Outlook etc)?
- ○ Yes, I have done it
- ○ Yes, I am going to do it
- ○ Yes, but I am not going to do it
- ○ No, but I want to do it
- ○ No and I am not going to do it

Do you know how to forward your mail?*
- ○ Do you know how to forward your mail
- ○ Yes, I have done it
- ○ Yes, I am going to do it
- ○ Yes, but I am not going to do it
- ○ No, but I want to do it
- ○ No and I am not going to do it

Anti-Virus SOPHOS [viruscheck.mak.ac.ug]*
Have you heard of SOPHOS prior the sensitization?
- ○ Yes, I have already installed it
- ○ Yes, but I have another anti-virus program I am satisfied with
- ○ No, but I am going to install it
- ○ Not applicable

VoIP / Intercom phones*
Do you use the VoIP in your office to call others on the campus
- ○ Yes, frequently
- ○ Yes, sometimes
- ○ Not at all
- ○ It doesn't work
- ○ I don't know what it is
- ○ Not applicable

Social media [http://mak.ac.ug/about-makerere/social-networks]
Have you ever used any of Makereres official social media outlets?
- ☐ Facebook
- ☐ Twitter
- ☐ Google+
- ☐ Vimeo
- ☐ YouTube
- ☐ LinkedIn
- ☐ Other:_____

Do you think you will use any of these social media outlets in the near future?
- ☐ Facebook
- ☐ Twitter
- ☐ Google+
- ☐ Vimeo
- ☐ YouTube
- ☐ LinkedIn
- ☐ Other:_____

Cloud computing
Have you ever used any of these services in your work?
- ☐ Google drive/docs
- ☐ Dropbox
- ☐ Skydrive
- ☐ Other:_____

Do you think that you will use this software in the near future?
- ☐ Google drive/docs
- ☐ Dropbox
- ☐ Skydrive
- ☐ Other:_____

DICTS ICT sensitization
Did you attend the sensitization at your college?*
- ○ Yes
- ○ No

Did you find this workshop useful?
                   1   2   3   4   5
 Not useful at all O   O   O   O   O   Very useful

Do you have any comments about the sensitization?

_____

_____

ICT support in your college / unit
Do you think the support in your college/unit is working well? (only answer if your have been in contact with a support unit)

	1	2	3	4	5	
Doesn't work at all	O	O	O	O	O	Works very well

Further comments
We are here to help you so if there is anything on your mind concerning the sensitization, DICTS in general or other ICT issues please leave a comment here

_____

_____

Thank you!

Your response has been recorded.

Directorate for ICT Support (DICTS)
VOIP (11) 111
helpme@dicts.mak.ac.ug ·
www.dicts.mak.ac.ug.

Appendix C – Results from staff questionnaire 2014

The survey was open between 2014-05-07 and 2014-07-13

A total of 23 people participated in this survey.

Profession

Out of the 23 participants in the survey:

- 11 people (48%) were lecturers
- 10 people (10%) were administrators
- 2 people (9%) were other staff

College

Out of the 23 participants in the survey:

- 10 people (43%) belong to College of Education and External Studies
- 6 people (26%) belong to College of Humanities and Social Sciences
- 4 people (17%) belong to College of Agricultural and Environmental Sciences
- 1 person (4%) belong to College of Engineering, Design, Art and Technology
- 1 person (4%) belong to Dean of Students

Note. There are a total of 13 colleges and 5 other groups

Computer Use

Out of the 23 participants in the survey:

- 12 people (52%) stated that they use the computer almost all day
- 7 people (30%) stated that they used the approximately half the day
- 2 people (9%) stated computer a smaller part of the day
- 0 people (0%) stated that they almost never or never used a computer during the day

They were given alternatives as to which media devices they use in their work and out of the 23 participants

- 5 people (22%) stated that they used a smart phone in their work
- 11 people (48%) stated that they use their personal laptop in their work (to conduct their work)
- 2 people (9%) stated that they used a laptop provided by the school
- 6 people (26%) stated that they use their personal desktop in their work (to conduct their work)
- 10 people (43%) stated that they used a desktop provided by the school
- 2 people (9%) stated that they use a tablet to conduct their work

Operating system OS

- 3 people (13%) stated that they used Windows 8
- 13 people (57%) stated that they used Windows 7
- 5 people (22%) stated that they used Windows XP
- 1 person (4%) stated that they used Windows but wasn't sure which version
- 1 person (4%) stated that they used Mac OS

Note. No one used Windows Vista, Ubuntu or Linux or other

Web Applications

The participants were asked to rate their usage of the different web applications which were available for staff and students

Web-based applications

ocw.mak.ac.ug (MOOC tool, MIT open courseware)

- 1 person (4%) stated that the service was very good
- 4 people (17%) stated that it was good
- 3 people (13%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 10 people (43%) stated that they don't use it
- 3 people (13%) stated that they have never heard of it

staff.mak.ac.ug (staff websites)

- 5 people (22%) stated that the service was very good
- 5 people (22%) stated that it was good
- 7 people (30%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 5 people (22%) stated that they don't use it
- 0 people (0%) stated that they have never heard of it

forum.mak.ac.ug (staff forums)

- 2 people (9%) stated that the service was very good
- 6 people (26%) stated that it was good
- 5 people (22%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 6 people (26%) stated that they don't use it
- 1 person (4%) stated that they have never heard of it

blogs.mak.ac.ug (staff blogs)

- 2 people (9%) stated that the service was very good
- 3 people (13%) stated that it was good
- 4 people (17%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 9 people (39%) stated that they don't use it
- 3 people (13%) stated that they have never heard of it

mair.mak.ac.ug (Institutional repository/submissions etc.)

- 1 person (4%) stated that the service was very good
- 1 person (4%) stated that it was good
- 3 people (13%) stated that is was ok
- 1 person (4%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 11 people (48%) stated that they don't use it
- 3 people (13%) stated that they have never heard of it

muele.mak.ac.ug (online learning platform)

- 4 people (17%) stated that the service was very good
- 2 people (9%) stated that it was good
- 7 people (30%) stated that is was ok
- 1 person (4%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 6 people (26%) stated that they don't use it
- 1 person (4%) stated that they have never heard of it

diectory.mac.ac.ug (staff directory)

- 2 people (9%) stated that the service was very good
- 1 person (4%) stated that it was good
- 8 people (35%) stated that is was ok
- 1 person (4%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 8 people (35%) stated that they don't use it
- 1 person (4%) stated that they have never heard of it

answers.mak.ac.ug (knowledge base)

- 4 people (17%) stated that the service was very good
- 2 people (9%) stated that it was good
- 3 people (13%) stated that is was ok
- 2 people (9%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 9 people (39%) stated that they don't use it
- 1 person (4%) stated that they have never heard of it

gradtrack.mak.ac.ug (thesis and project tracking)

- 1 person (4%) stated that the service was very good
- 0 people (0%) stated that it was good
- 7 people (30%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 8 people (35%) stated that they don't use it
- 3 people (13%) stated that they have never heard of it

events.mak.ac.ug (Makerere events)

- 5 people (22%) stated that the service was very good
- 5 people (22%) stated that it was good
- 4 people (17%) stated that is was ok
- 1 person (4%) stated that it was bad
- 0 people (0%) stated that it was very bad

- 3 people (13%) stated that they don't use it
- 2 people (9%) stated that they have never heard of it

docs.mak.ac.ug (database for documents)

- 4 people (17%) stated that the service was very good
- 4 people (17%) stated that it was good
- 7 people (30%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 4 people (17%) stated that they don't use it
- 2 people (9%) stated that they have never heard of it

viruscheck.mak.ac.ug (SOPHOS antivirus)

- 5 people (22%) stated that the service was very good
- 4 people (17%) stated that it was good
- 4 people (17%) stated that is was ok
- 0 people (0%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 6 people (26%) stated that they don't use it
- 2 people (9%) stated that they have never heard of it

webmail.mak.ac.ug (Makerere web-mail) [Web-based applications]

- 10 people (43%) stated that the service was very good
- 8 people (35%) stated that it was good
- 2 people (9%) stated that is was ok
- 1 person (4%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 0 people (0%) stated that they don't use it
- 0 people (0%) stated that they have never heard of it

intranet.mak.ac.ug (Makerere intranet) [Web-based applications]

- 9 people (39%) stated that the service was very good

- 7 people (30%) stated that it was good
- 4 people (17%) stated that is was ok
- 1 person (4%) stated that it was bad
- 0 people (0%) stated that it was very bad
- 1 person (4%) stated that they don't use it
- 0 people (0%) stated that they have never heard of it

When they were asked if they would use any of these web applications in the future this is the result

- 11 people (48%) ocw.mak.ac.ug (MOOC tool, MIT open courseware)
- 17 people (74%) staff.mak.ac.ug (staff websites)
- 18 people (78%) forum.mak.ac.ug (staff forums)
- 13 people (57%) blogs.mak.ac.ug (staff blogs)
- 13 people (57%) makir.mak.ac.ug (Institutional repository/submissions etc.)

- 16 people (70%) muele.mak.ac.ug (online learning platform)
- 15 people (65%) diectory.mac.ac.ug (staff directory)
- 13 people (57% answers.mak.ac.ug (knowledge base)
- 11 people (48%) gradtrack.mak.ac.ug (thesis and project tracking)
- 14 people (61%) events.mak.ac.ug (Makerere events)
- 20 people (87%) docs.mak.ac.ug (database for documents)

Internet satisfaction

The participants were asked the internet at their college unit at Makerere from 1-5, where 1 is not satisfied and 5 is satisfied

- 1 person (4%) stated that they were not satisfied at all
- 4 people (17%) stated that they were not satisfied
- 10 people (43%) stated that they were ok
- 6 people (26%) stated that they were satisfied
- 2 people (9%) stated that they were very satisfied

The participants were asked if the OS they used was licensed

- 17 people 74% answered yes
- 2 people 9% answered no
- 4 people 17% did not know

Web Mail

The participants were asked if they knew how to configure their webmail with and external email client

- 8 people (35%) stated that they knew and that they had done it.
- 1 person (4%) stated that they knew and were going to do it
- 1 person (4%) state that they knew how do it but weren't going to do it
- 12 people (52%) stated that they didn't know, but they wanted to do
- 1 person (4%) stated that they didn't know how to do It and that they were not intending to do it

The participants were asked if they knew how to forward their email to another account

- 22 people (96%) stated that they knew and that they had done it.
- 0 people (0%) stated that they knew and were going to do it
- 1 person (4%) stated that they knew how do it but weren't going to do it
- 0 people (0%) stated that they didn't know, but they wanted to do
- 0 people (0%) stated that they didn't know how to do It and that they were not intending to do it

Anti – Virus

- They participants were asked about whether they had heard about the antivirus program Sophos
- 7 people (30%) stated that they had heard of it and installed it.
- 10 people (43%) stated that they had heard of it but had another anti-virus program that they were satisfied with.
- 3 people (13%) stated that that they hadn't heard of it but were going to install it
- 3 people (13%) stated Not Applicable to this question

VoIP

The participants were asked whether they used the VoIP to call others on the university

- 4 people (17%) Yes, frequently
- 1 people (4%) Yes, sometimes
- 10 people (43%) Not at all
- 5 people (22%) It doesn't work
- 1 person (4%) I don't know what it is
- 2 people (9%) Not Applicable

Social media

The participants were asked whether they had used any of the following social media of Makerere

- 13 people (57%) had used Facebook
- 4 people (17%) had used Twitter
- 8 people (35%) had used Google+
- 1 person (4%) had used Vimeo
- 6 people (26%) had used YouTube
- 5 people (22%) had LinkedIn
- 4 people (17%) had used other social media platforms

The participants were asked whether they would use any of them in the future

- 15 people (65%) Facebook
- 14 people (61%) Twitter
- 13 people (57%) Google+
- 5 people (22%) Vimeo
- 17 people (74%) YouTube
- 15 people (65%) LinkedIn
- 1 people (4%) Other

Cloud computing

The participants were asked if they had ever used any of these services in their work

- 15 people (65%) Google drive/docs
- 14 people (61%) Dropbox
- 5 people (22%) Sky drive
- 2 people (9%) Other

Cloud computing

The participants were asked whether they would consider using the software in the near future

- 20 people (87%) Google drive/docs
- 19 people (83%) Dropbox
- 14 people (61%) Sky drive
- 0 people (0%) Other

DICTS ICT Sensitization

The participants were asked if they attended the sensitization at their college

- 10 people (43%) said yes
- 13 people (57%) said no

They were asked to rate it from 1-5 where 1 was not useful and 5 was very useful

- 2 people (15%) said is was not useful
- 0 people (0%)
- 1 person (8%)
- 1person (8%)
- 9 people (69%) stated that is was very useful

The participants were asked to rate the ICT support they received in their college from 1 to 5 where 1 was "doesn't work at all" and 5 was "works perfect"

- 0 people (0%) stated that is doesn't work at all
- 3 people (14%)
- 7 people (32%)
- 6 people (27%)
- 6 people (27%) stated that is works perfect

Appendix D – Comments from questionnaire 2014

Sensitization

1. "This sensitization should be done at least once in a semester"
2. "It was good and more of that kind is needed"
3. "DICTs should invite administrators and secretaries of the college too"
4. "The time we had with DICTS was not enough, I would like more training in all the materials they deliver during the lectures"
5. "Request to DICTS to make a mandatory sensitization to all the staff member, as you will analyze that people who don't use these service didn't attend the sensitization at their respective colleges. Thanks"
6. "This should be an annual event and the training should not be too technical as it was in CHUSS."
7. "It was so useful and more ICT sensitization programs should be carried out so that those staff who missed the last one can also get to know the different ICT services offered by DICTS"
8. It should be done periodically
9. The terms used are for computer experts not normal computer users
10. We need another session for CEES
11. Please re do the sensitisation
12. I need to participate in more sensitization seminars

DICTS

1. the ICT support link persons in this college are very busy and do not respond quickly enough to members needs. The ICT unit density or availability is too thin to improve the delivery of services to the clients.
2. I think we badly need help so we can use ICT more regularly and in many more situations.
3. They should allow us to use YOUTUBE, DICTs should train us how to install certain programmes especially most of us who still use windows xp
4. VoIP phones should be followed and deployed at least every unit/ sub unit in the college because the intercoms no longer work in our college thus there is a gap between SDLL and SoE as they far a distance to the other. Thanks
5. The IT Technician in Senate Building is quite busy I suppose and quite difficult to catch.
6. DICTS KEEP IT UP
7. Need more knowledge on ICT platforms that assist in teaching with even regular refresh courses or notices.
8. We need more than one function internet port and cable in our offices because offices are shared.

1. Please help us increase on the mail quota. 2. Put back the mail capacity option that used to be there on the old webmail page 3. Reconfigure the VOIPs as you are expected.
9. Didn't understand you survey question on Web-based applications; "What do you think of these web-applications?" The scales given e.g. Good, bad etc on which to select, did not mean as much. Do you plan on conducting these sensitisations, basing on academic disciplinary needs?
10. Consider certain systems mandatory. For example the forums and the blogs. Train people on how to use the doc.mak.ac.ug to upload documents then send a link to the general staff mailing lists. Thank you
11. Sensitization is important. I personally was not aware of many of these ICT services. It is rare for some of us to go scrawling around for whatever we might find on the university website. It s good to know what is there and what one can use it for. Sometimes it may be necessary to know how to use it, and that is where technical support comes in handy. Unfortunately, our support units seem to come in only when there is trouble shooting to be done. They don't seem to see general information dissemination and training as their responsibility. And DICTS is often too far away.
12. Organize more trainings for CAES, but they should be advertised well by the CAES PRO. The other time the title of the message/advert was misleading. People though DICTS was just visiting the Principle's Office

Appendix E – Student questionnaire 2016

ICT experience at Makerere University

This survey is part of a thesis project monitoring the quality of Information and Communications Technologies (ICT) services at Makerere University from the students' perspective. This form is anonymous and your answers will be used as a basis to map out the current perceived ICT-experience at Makerere University.

Part I: Background information.
Please circle the <u>letter</u> next to your answer

1.) Gender
   a. Female
   b. Male

2.) Age
   a. 20 or younger
   b. 21-25
   c. 26-30
   d. 31-35
   e. 36 or older

3.) Which college do you belong to? Eg. College of Natural Sciences

   _____

4.) Year(s) in University
   a. 1
   b. 2-3
   c. 4 -5
   d. 5 or more

5.) Which degree are you pursuing
   a. Bachelor
   b. Master
   c. Diploma
   d. Other_____

Part II. ICT at Makerere
Please circle the underline number which you think is most appropriate

6.) Have you had any formal training in or introduction to the different ICT-resources at Makerere University?
      a. Yes
      b. No

7.) I had a lot of experience with ICT before I started university
Strongly agree   1   2   3   4   5
      Strongly disagree

8.) The ICT resources at Makerere University are generally good

Strongly agree   1   2   3   4   5
      Strongly disagree

9.) The ICT resources in my college are generally good

Strongly agree   1   2   3   4   5
      Strongly disagree

10.)   The internet resources are generally good at Makerere University

Strongly agree   1   2   3   4   5
      Strongly disagree

11.)   The ICT resources at Makerere University are essential to my academic work

Strongly agree   1   2   3   4   5
      Strongly disagree

12.)   I find the ICT resources at Makerere University enjoyable to use

Strongly agree   1   2   3   4   5
      Strongly disagree

13.) Which facilities do you use *(You can choose many)*

[ ] Internet kiosks
[ ] Library
[ ] Personal PC/laptop
[ ] College resources (Computer labs etc)
[ ] Other _____

14.) Rank the following from the most important to the least important tool for your academic work. *1 is the most important and 5 is the least important*

[ ] Smartphone
[ ] Personal Laptop
[ ] Personal PC
[ ] Public/School PC
[ ] Tablet

Part III E-learning

15.) Have you used MUELE in your academic work
   c. Yes
   d. No

16.) Muele is easy to use (*Please circle the <u>number</u> which you think is most appropriate*)
   Strongly agree 1   2   3   4   5
   Strongly disagree

17.) Muele is essential to my academic work
   Strongly agree 1   2   3   4   5
       Strongly disagree

18.) I like using Muele
   Strongly agree 1   2   3   4   5
   Strongly disagree

Do you have any final comments about the ICT – resources at Makerere University

_____

_____

_____

Thank you for your participation!

Appendix F – Result from student questionnaire 2016

The survey was handed out in 2016

A total of 56 people participated in this survey.

Gender

56 people participated in this survey and among those:

- 21 respondents (37%) are women
- 35 respondents (67%) are men

Age

56 people participated in this survey and among those:

- 2 respondents (4%) are 20 or younger
- 29 respondents (52%) are 21-25
- 11 respondents (20%) are 26-30
- 7 respondents (12%) are 31-35
- 7 respondents (12%) are 36 or older

College

56 people participated in this survey and among those:

- 6 respondents (11%) belong to CAES
- 16 respondents (29%) belong to CoBAMS
- 4 respondents re (7%) belong to CIT
- 5 respondents (9%) belong to CEES
- 8 respondents (14%) belong to CEDAT
- 13 respondents (23%) belong to CHUSS
- 1 respondent (2%) belong to CoNaS
- 3 respondents (5%) did not answer or did not give a comprehensible answer

Years in University

56 people participated in this survey and among those:

- 5 respondents (9%) have been studying 1 year or less in the University
- 33 respondents (59%) have been studying for 2-3 years in the University
- 12 respondents (21%) have been studying for 4-5 years in the University
- 5 respondents (9%) have been studying for 5 years or more in the University
- 1 respondent (2%) did not answer or did not give a comprehensible answer

Degree

56 people participated in this survey and among those:

- 28 respondents (50%) are pursuing a bachelor's degree
- 26 respondents (46%) are pursuing a master's degree
- 1 respondent (2%) are pursuing another type of degree (PHD)
- 1 respondent (2%) did not answer or did not give a comprehensible answer

Formal ICT training

56 people participated in this survey and among those:

- 33 respondents (59%) had formal training in ICT before they started university
- 21 respondents (37%) had not had formal training in ICT before they started university
- 2 respondents (4%) did not answer or did not give a comprehensible answer

I had a lot of experience with ICT before I started university

56 people participated in this survey and among those:

- 15 respondents (27%) strongly agree
- 14 respondents (25%) agree
- 11 respondents (20%) neither agree nor disagree
- 4 respondents (7%) disagree
- 10 respondents (18%) strongly disagree
- 2 respondents (3%) did not answer or did not give a comprehensible answer

The ICT resources at Makerere University are generally good

56 people participated in this survey and among those:

- 13 respondents are (23%) strongly agree
- 13 respondents are (23 agree
- 17 respondents are (30%) neither agree nor disagree
- 6 respondents are (11%) disagree
- 5 respondents are (9%) strongly disagree
- 2 respondents are (4%) did not answer or did not give a comprehensible answer

The ICT resources at my college are generally good

56 people participated in this survey and among those:

- 11 respondents (20%) strongly agree
- 7 respondents (12%) agree
- 21 respondents 38%) neither agree nor disagree
- 8 respondents (14%) disagree
- 8 respondents (14%) strongly disagree
- 1 respondent (2%) did not answer or did not give a comprehensible answer

The internet resources are generally good at Makerere University

56 people participated in this survey and among those:

- 11 respondents (20%) strongly agree
- 19 respondents (34%) agree
- 17 respondents (30%) neither agree nor disagree
- 3 respondents (5%) disagree
- 5 respondents (9%) strongly disagree
- 1 respondent (2%) did not answer or did not give a comprehensible answer

The ICT resources at Makerere University are essential to my academic work

56 people participated in this survey and among those:

- 31 respondents (55%) strongly agree
- 10 respondents (18%) agree
- 6 respondents (11%) neither agree nor disagree
- 3 respondents (5%) disagree
- 5 respondents (9%) strongly disagree
- 1 respondent (2%) did not answer or did not give a comprehensible answer

12 I find the ICT resources at Makerere University enjoyable to use

56 people participated in this survey and among those:

- 20 respondents (36%) strongly agree
- 13 respondents (23%) agree
- 12 respondents (21%) neither agree nor disagree
- 6 respondents (11%) disagree
- 3 respondents (5%) strongly disagree
- 2 respondents (4%) did not answer or did not give a comprehensible answer

13. ICT Facilities

57 people participated in this survey and among those:
- 15 respondents (26%) use internet kiosks.
- 41 respondents (72%) use the library
- 38 respondents (67%) use a personal laptop or personal PC.
- 21 respondents (37%) use college resources (college labs etc.)
- 4 respondents (7%) use other facilities like;
  Smartphone, main library (post graduate lab)), projectors, phone

ICT Tools

40 people participated in this survey and among those:
- 13 respondents (33%) use smart phones
- 32 respondents (80%) use personal laptop
- 12 respondents (30%) use personal PCs.
- 13 respondents (33%) use public PCs or school PCs.
- 0 respondents (0%) use Tablets
- 1 respondent (3%) did not answer or did not give a comprehensible answer

Have you used MUELE in your academic work

56 people participated in this survey and among those:

- 16 respondents (29%) have used MUELE
- 36 respondents (64%) have not used MUELE
- 4 respondents (7%) did not answer or did not give a comprehensible answer

MUELE is easy to use

16 people participated in this survey and among those:

- 5 respondents (31%) strongly agree
- 4 respondents (25%) agree
- 2 respondents (12%) neither agree nor disagree
- 2 respondents (13%) disagree

- 1 respondent (6%) strongly disagree
- 2 respondents (13%) did not answer or did not give a comprehensible answer

MUELE essential to my academic work

16 people participated in this survey and among those:

- 6 respondents (37%) strongly agree
- 4 respondents (25%) agree
- 1 respondent (6%) neither agree nor disagree
- 2 respondents (13%) disagree
- 1 respondent (6%) strongly disagree
- 2 respondents (13%) did not answer or did not give a comprehensible answer

I like using MUELE

16 people participated in this survey and among those:

- 4 respondents (25%) strongly agree
- 4 respondents (25%) agree
- 4 respondents (25%) neither agree nor disagree
- 2 respondents (12%) disagree
- 0 respondents (0%) strongly disagree
- 2 respondents (13%) did not answer or did not give a comprehensible answer

Appendix G – Comments from questionnaire 2016 about ICT resources

1. They should increase the BW[bandwidth]/Wi-Fi for internet/intranet provided for students

2. Yes - the ICT resources enable the students (to) improve on their class performance through research and the allocation of literature materials for coursework and assignments.

3. They should increase on the number of materials/tools used to access internet for example network cables, computers in labs

4. Labs for colleges not convenient enough. In this I mean they don't have the latest machines which forces me to purchase my own laptop

5. Need to be improved and further made available to all students. Should also be directly incorporated into teaching methods.

6. They need to be improved and made accessible from a wide range of locations for example in schools, compounds, halls of residence.

7. There is a need to expand IT coverage. Comprehensive training to the college [CEDAT]. Upgrade its efficiency

8. ICT in Makerere University generally needs to be upgraded. It also needs to be put as one of the core lectures in all the facilities and colleges

9. The resources are generally good especially for the post graduate students

10. The internet is slow and the systems are always down which brings delay in work accomplishments. I do request the university to look down on that issue

11. Improvements should be made at college level so as to ease work

12. The computers are less and not enough for all students. There is a lot of theory with less practicals

13. Could get better.

14. Fairly essential to my academics

15. The internet is good at the campus.

16. It's a good programme but more is needed to make it better. Thanks.

17. ICT resources at Makerere University strictly speaking are good though future improvements are required.

18. CIT lacks serious exhibitions

20. They try their bet to provide to us the required materials though many students are not aware of these resources. – Need to train

21. The ICT in Makerere University is generally not favourable and accessible.

22. For example at technology, only students of technology were allowed to use these computer labs. Us from other faculties were not allowed. Therefore they should be make these computer labs available for all students.

23 .General in any college it's very poor

24. Good.

25. They should improve on their network capacity and frequency

26. There is need to put in place more computers to reach the demands of the students more so college computer labs.

27. The ICT at MUK is somehow good but still more resources are needed in my college [CEES]

28. The ICT resources at Makerere University are good but they are not easy to get to. I would rather use an internet kiosk than a computer lab at school

29. The ICT resources of Makerere University are moderately good as they restrict any bad usage - at the same time allowing a student to carry out all their research either with university or personal computers.

30. ICT resources are not enough especially at the college of education, therefore more should be provided to enable all the students access ICT. Knowledge to enable them simplify difficulties in their coursework, research and others

31. No. They are okay!!

32. We have a chance to use the internet all day if available. Thank you

33. There are surely good but the university needs to decentralise them more so that all students at colleges can access the services mostly wireless internet, good computers and probably a resourceful person in the computer labs to ease the learning process.

34. The Internet could be made more reliable

35. Wireless internet services need to be improved.

36. Needs improvement to a faster network. Allow YouTube all time because it also has videos for learning purposes.

37. They are good.

38. ICT resources at Makerere University is important as it enhances the research of learners when revising and coursework

39. Needs to be improved to world class and much accessible

41. No.

42. - The facilities in the colleges need to be improved. – The internet speed is still not good compared to elsewhere!

43. A lot has to be done on network connectivity to ICT resources. Internet speed has to be improved.

44. With regards to MUELE is of[f] and on but research computers internet is steady.

45. We need to subscribe to more good journal publishers to avoid limitations to access of published journal article. Most of them are limited where learners need to purchase/pay which is costly

46. They are efficient but sometimes the internet is on and off and power outages

49. I have learnt some e good skills in ITC at Makerere Library. Good.

51. No comment

52. General improvement required

53. Improve on the coverage of MAKair

54. Needs to upgrade internet. Installing statsistcal package on computers for data analysis eg spss, infostrata. Upgrading the anti-viruses. Installing referensincg software on all computers, mendlee,zotes,endnote.. College labs should have a knowledgable informations desk.

55. The internet at Makerere is not always stable

56. Generally they are essential efficient and effective.

Appendix H – Web based applications

Web Application	Description/Purpose	Target group
MIT Open Coursware ocw.mak.ac.ug	Makerere Open Courseware is a link to MIT OpenCourseWare (OCW) which is a web-based publication of virtually all MIT course content. This is a link hosted on Makereres servers so that the content can be accessed smoothly while on the Makerere network.	Staff and students
Staff websites staff.mak.ac.ug	This is the staff website for Makerere. It associates the works, publications etc, with respective member of staff and it works as a unified page linking to other pages like staff forums and staff blogs.	Staff
Staff forums forum.mak.ac.ug	The forum is used to discuss topics which concern the staff.	Staff
Staff blogs blogs.mak.ac.ug	In the staff blogs staff are encouraged to blog about what they wish.	Staff
Institutional repository makir.mak.ac.ug	MakIR is a collection of scholarly output of by researchers of Makerere University, including scholarly articles and books, electronic theses and dissertations, conference proceedings, technical reports and digitized library collections.	Staff and students
E-learning platform muele.mak.ac.ug	Makerere University e-learning platform is used by teachers and students to interact and share information during courses.	Staff and students
Staff directory diectory.mac.ac.ug	The staff directory contains contact information to staff at Makerere. The information has partly been uploaded by DICTS but a staff can add information by logging in and uploading info such as pictures, blog addresses and so on.	Staff
Knowledge base answers.mak.ac.ug	This knowledge base was created by DICTS and serves as a FAQ where they have posted answers to a variety of questions and problems.	Staff and students
Thesis and project trackinggradtrack.mak.ac.ug	Grad Track is a tool used for monitoring a student's research process.	Staff and students
Makerere events events.mak.ac.ug	This is a calendar which list all bigger events and activities at t Makerere University	Staff and students
Document management system docs.mak.ac.ug	The document management system is used for storing electronic versions of all of university related documents generated from meetings, conferences etc.	Staff

Appendix I – DICTS sensitization programme

ICT SENSITIZATION DRIVE PROGRAMME OUTLINE FOR MAKERERE UNIVERSITY

Introduction (9 AM- 9:45 AM) by
Mugabi Samuel

End-user Support Manager will start by making an introduction on the background of DICTS and its mandate within Makerere University. As well as new developments in DICTS.

(1) RENU network connectivity.

(2) Moving student emails to the Gmail platform thus creating more space for staff mail.

(3) ICT policies within Makerere

(4) Status of MAKAIR

Makerere Web-based applications (9:45AM -10:30AM) by
Denis Wamala

(1) Makir.mak.ac.ug (Institutional repository/submissions etc.)

(2) ocw.mak.ac.ug (MOOC tool)

(3) staff.mak.ac.ug (staff websites)

(4) forum.mak.ac.ug (staff forums)

(5) blogs.mak.ac.ug (staff blogs)

(6) directory.mak.ac.ug

(7) College/unit-based Social media platforms and their importance to web-Presence (Facebook, Google +, Twitter etc.) for Makerere University.

(8) Webmail services (configuring mail clients,forwarding,deleting,mail quotas)

Google Cloud based services and promoting a paperless environment (10:30AM-11:15 AM) by
Arthur Opio

Collaborate and present (Google Docs)
(1) Share presentations with your friends and co-workers.

(2) Upload and convert existing presentations to Google Docs format.

(3) Download your presentations as a .pdf, .pptx, or a .txt file.

(4) Insert images and videos, and format your slides.

(5) Publish and embed your presentations in a website, allowing access to a wide audience.

(6) Draw organisational charts, flowcharts, design diagrams and much more right within a presentation.

(7) Add slide transitions, animations, and themes to create show-stopping presentations.

(8) General Internet usability.

Improving the PC environment for better Quality of Experience (QoE) (11:15 AM- 12:00 PM) by Yunusu Musisi	Ways on how to improve your PC for better usability and productivity.
Network Access Control, SOPHOS and MUELE (12:00PM-1:00PM) by Mpirirwe Stephen	Stephen will talk about how network access control will be implemented on the Makerere network plus its benefits. Staff will be shown how to navigate the online learning platform (MUELE) as well as the usage of the Enterprise anti-virus SOPHOS

In between the training sessions, staff will be encouraged to ask questions. We encourage staff to bring along their laptop/tablets for the sensitization.