

Bishop Stuart University



Internet Accessibility and ICT use in Teaching and Learning in Secondary Schools of Sheema District

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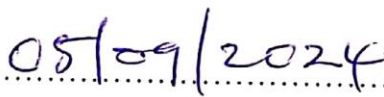
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Declaration

I, Barekye Barisigara, do hereby declare that the work contained in this dissertation title “Internet accessibility and ICT use in teaching and learning in secondary schools of Sheema District” is my original work and has never been submitted to any other academic institution for any award.

Signature..........

Date..........

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Approval

This dissertation entitled “Internet accessibility and ICT use in teaching and learning in secondary schools of Sheema District” has been done under our supervision and is submitted with our approval.

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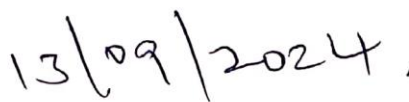
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Dedication

I dedicate this dissertation to my family members; my wife Komugisha Clare, my daughter Amanyar Darlen, my sons Davis and Davin and my father Barisigara John for their love and care while pursuing this course. May the Almighty God reward them for their encouragement care and support given to me.

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List of Acronyms

BSU:	Bishop Stuart University
CVI:	Content Validity Index
ICT:	Information and communication technologies
MEAP:	Master of Education Administration and Planning
MOOC:	Massive Open Online Courses
REC:	Research Ethics Committee
SPSS:	Statistical Package for the Social Sciences
UNESCO:	United Nations Educational, Scientific and Cultural Organization
WHO:	World Health Organization

Abstract

The study assessed internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District. The study used a cross-sectional research design with both quantitative and qualitative approaches. The study population comprised 12 headteachers, 360 teachers, and 440 students, with a sample size of 268 respondents. Purposive and simple random sampling techniques were used for participant selection. Data were collected through a questionnaire survey for teachers and students and interviews for headteachers. Data analysis involved sorting, coding, and summarizing qualitative data and using Pearson coefficient correlation for quantitative data. The findings showed positive perceptions among students regarding internet accessibility, with an overall mean score of 3.62. Most students reported favorable experiences with internet availability, data sufficiency, internet speed, affordability, and access to electricity at schools. Similarly, a significant majority of participants recognized the benefits of ICT in enhancing teaching and learning, with an overall mean score of 3.70. The study also found a statistically significant correlation (p-value of 0.001, $r=0.6$) between internet accessibility and ICT use teaching and learning, suggesting that improvements in internet accessibility positively impact the teaching and learning process. In conclusion, students in Sheema District have positive perceptions about internet accessibility, and there is a significant correlation between internet accessibility and ICT use teaching and learning. As recommendations, the government should invest in improving internet connectivity and digital resources for a conducive learning environment, and stakeholders should promote the integration of ICT in teaching methodologies.

Chapter One

Introduction

Introduction

This chapter presents background of the study, statement of the problem, purpose of the study, research objectives, research questions/hypothesis of the study, scope of the study, significance of study and conceptual frame work.

Background

Historical Background

Globally, ICT in teaching offers exciting opportunities to expand the learning environment for diverse student populations (Kyei-Blankson & Keengwe, 2013) . As the demand for internet access in teaching increases, college professors may be asked to consider teaching their classes digitally. ICT in teaching shares much with face-to-face teaching, but it also has unique set of skills and requirements (Rapanta, Botturi, Goodyear, Guàrdia & Koole, 2020). ICT in teaching involves the auditory, visual, and tactile senses (Debevc, Weiss, Šorgo, & Kožuh, 2020). The traditional way of learning in secondary schools is not for everyone. ICT in teaching is for those who wish to study for a degree alongside work or other commitments. ICT in teaching has been referred to as a form of distance education and as web-based learning, e-learning, and digital learning.

Education is the process of transferring knowledge, values, methods, skills, and beliefs from one individual to another (Barrett, Huber & Reynolds, 2014). Distance education originated in the United States in the 1800's when teachers and learners at the University of Chicago were at different locations and tried to connect through correspondence courses. In the mid-1980s, the first

online college courses were initiated by several universities and schools. The Internet is now playing a bigger role in our lives and dictating how we live, socialize, teach, and learn (Sadiku, Adebo & Musa, 2018).

In Africa, as the Internet is developing into a main educational tool, online education offers the teacher and the learner access to numerous resources (Succi & Canovi, 2020). During the last decade online education of various kinds, often called distance education or web-based education, has become a normal part of many university programs. ICT in teaching and learning is designed to reach and engage the modern learner on one-to-one basis anywhere, anytime. A popular one involves massive open online courses (MOOC), which have grown involving many researchers and research institutions.

The reasons for offering ICT in teaching include convenient access for students, higher degree completion rates, and the appeal of such courses to nontraditional students (Goldberg, Bell, King, O'Mara McNerney, Robinson & Vickers, 2015). The key to a successful implementation of ICT in teaching and learning is taking student characteristics into account. The urgent imperative to ICT in teaching and ICT in learning caused by the recent Covid-19 pandemic (World Health Organization). Online teachers have had to prepare and deliver their classes from schools, with all the practical and technical challenges, and often without proper technical support. The crucial need for students is to focus on the importance of ICT in teaching, that is, to upgrade their knowledge and skills continuously, to think critically and to inspire creativity and innovation so as to adapt to global change (Succi & Canovi, 2020). A new teaching and learning paradigm, e-learning, has emerged as a result of the rapid diffusion of ICT.

In Uganda, according to Ghavifekr & Rosdy, (2015), ICT in teaching and online learning is presently considered by many as an innovation which will improve access to advanced

educational experiences by allowing students and teachers to participate in remote learning communities and to improve quality and effectiveness of education by supporting a collaborative learning process. School schedules are interrupted; students' and teachers' participation on online lessons are low; and they spend more time travelling to and from school than learning and teaching (Cook & Sonnenberg, 2014). The absence of teachers and the inability to provide substitute teachers cause the students to leave school earlier, so the curriculum requirements for the year are not met. Many students enroll in private lessons, which are expensive and not affordable by most families.

Theoretical Background

The study utilized Expectancy Value Models of Motivation developed by John William Atkinson in 1962. The Expectancy Value Models of Motivation helped us understand what students valued and what they believed in the educational context. Chen, (2010) highlighted three expectancy constructs: causal attributions, implicit theories of ability, and self-efficacy. If students could relate their effort to their success, their self-esteem was positively affected. Hood, Creed, & Neumann, (2012) suggested that motivation played a crucial role in the online class environment. The motivated students tended to have engaging learning experiences as they spent time viewing and reviewing the course content. Therefore, it was essential to assess the effect of internet accessibility and ICT use in teaching and learning in government aided secondary schools.

Conceptual Background

The study had two variables, namely internet accessibility as the independent variable and ICT use in teaching and learning as the dependent variable. Internet accessibility was conceptualized as network availability, internet speed, and financial constraints (data). ICT use in

teaching and learning were conceptualized as attending digital lessons, doing exercises in time, doing exams and tests, effective communication between teachers and learners. The internet was a technology that had become an enormous part of people's daily lives (Al Nuaimi, Al Neyadi, Mohamed & Al-Jaroodi, 2015). It acted as a support medium in various functions, leading to its introduction to academic institutions as a tool to enhance students' academic experience in the mid-1990s (Colombi & Knosp, 2017). The internet played a pivotal role as the key information and communication technology, bringing about a revolutionary change in the global information landscape. It served as a platform for various activities across all age groups in society.

Using the internet for educational purposes was found to be crucial for academic achievement by Kim, Kim, Park, Kim & Choi, (2017). The availability of the internet was widespread, with most students having access to it on their cellphones. This accessibility facilitated the expansion of academic knowledge, research, and assignments by enabling access to information from around the world. Additionally, it enhanced easy communication within the academic community. Access to computers and internet connection in schools contributed to students' academic performance and self-learning skills.

Contextual Background

Information communication technologies in teaching and internet accessibility in secondary schools in Uganda has been used both by students and their teachers in the process of exchanging information and gaining knowledge as well as for communication and access to educational information (Newby, Hite, Hite & Mugimu, 2013). There are other uses such as for conducting digital classes, whereby the teacher and the students are in remote places but are able to conduct lessons in class with the help of these technological tools and services (Busulwa &

Bbuye, 2018). The basic components of ICT in teaching and internet accessibility includes sets of computers (clients) from where users access materials and another computer (server) on which the learning materials and knowledge contents are centrally stored, for collaboration among the students in their learning processes and among the teachers for research, in general.

According to Guma, (2013), online-learning technologies are used to deliver learning instructions to learners who are located in remote areas from a central site using computers, mobile phones, over computer networks, internet connections and other methods of connection at cheaper cost. However, wide adoption of Information and Communication technologies (ICT) in teaching and learning, internet accessibility is still a challenge and a lot more work has to be done to realize the full potential of ICT in teaching. Therefore the current study assessed internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District.

Teachers and students in secondary schools in Sheema District lack the required skills for designing use of ICT in lessons even there is inappropriate infrastructure to support ICT in teaching and internet accessibility, cost of data is high. For ICT in teaching to be widely adopted, teachers need to be adequately trained in ICT course design and mechanisms put in place to motivate the teachers to teach using ICT, and cost of data must be reduced which majorly reduces the accessibility of internet by both teachers and learners. Use of ICT packages in other administrative units like assessment and evaluation of academic performance, monitoring school fees payments and teachers performances and other internal controls.

Problem Statement

Effective use of ICT in teaching by teachers leads to positive outcome as far as development of education sector is concerned (Gerick, Eickelmann & Bos, 2017). For this study

ICT in teaching is the access of learning experiences by the use of technology and internet, making the learning experience more convenient to learners (Wanga, Ngumbuke & Oroma, 2012).

Despite the fact that ICT is being introduced in teaching and learning, internet connectivity remains a challenge for academic purposes. This is evidenced by poor network connectivity in most areas, high costs of data and lack of reliable power supply in most areas.

While information communication technologies in teaching provide opportunities for the ways education is delivered, administered and accessed by learners, assessment practices are often limited in the variety and modes in which they are allocated in the ICT environment. A study by Kansiiime, (2021) concluded that internet connectivity and power supply were unreliable most especially in schools situated in rural areas. Therefore, the study assessed the influence of internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District.

Purpose of the Study

The purpose of the study was to assess the extent of internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District.

Objectives of the Study

- (i) To determine the extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District.
- (ii) To establish the level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools of Sheema District.

- (iii) To establish the relationship between ICT use and teaching and learning in government aided secondary schools of Sheema District.

Research Questions

- (i) What is the extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District?
- (ii) What is the level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools of Sheema District?

Hypothesis of the Study

H_0 : There is no statistically significant relationship between internet accessibility and ICT use in the teaching and learning in government aided secondary schools of Sheema District.

Scope of the study

The scope of the study was presented in three perspectives namely; content scope, geographical scope and time scope as below;

Content Scope

The study assessed the extent of internet accessibility and ICT use in teaching and learning in government aided secondary schools. Therefore content scope covered objectives of the study; the extent of internet access and ICT use for teaching and learning, the level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools and the relationship between internet accessibility and ICT use in teaching and learning.

Geographical Scope

The study was carried out in Secondary schools in Sheema District. Sheema District is bordered by Buhweju District to the north, Mbarara District to the north east, Ntungamo District to the south, Mitooma District to the southwest, Rwampara District to the East and Bushenyi District to the West. Kibingo, where the district headquarters are located, lies 04 Kilometres, by road, west of Mbarara, the largest city in Ankole Sub-Region. Government aided secondary schools in Uganda face challenges in accessing and utilizing Information and Communication Technology (ICT) resources, which can hinder the effective integration of ICT in teaching and learning.

Time Scope

The researcher used data of a period of last 5 years; that is from 2017 to 2022. The researcher assumed that this period was good enough to give a picture about ICT in ICT use in teaching and learning in Secondary Schools of Sheema District.

Significance of the study

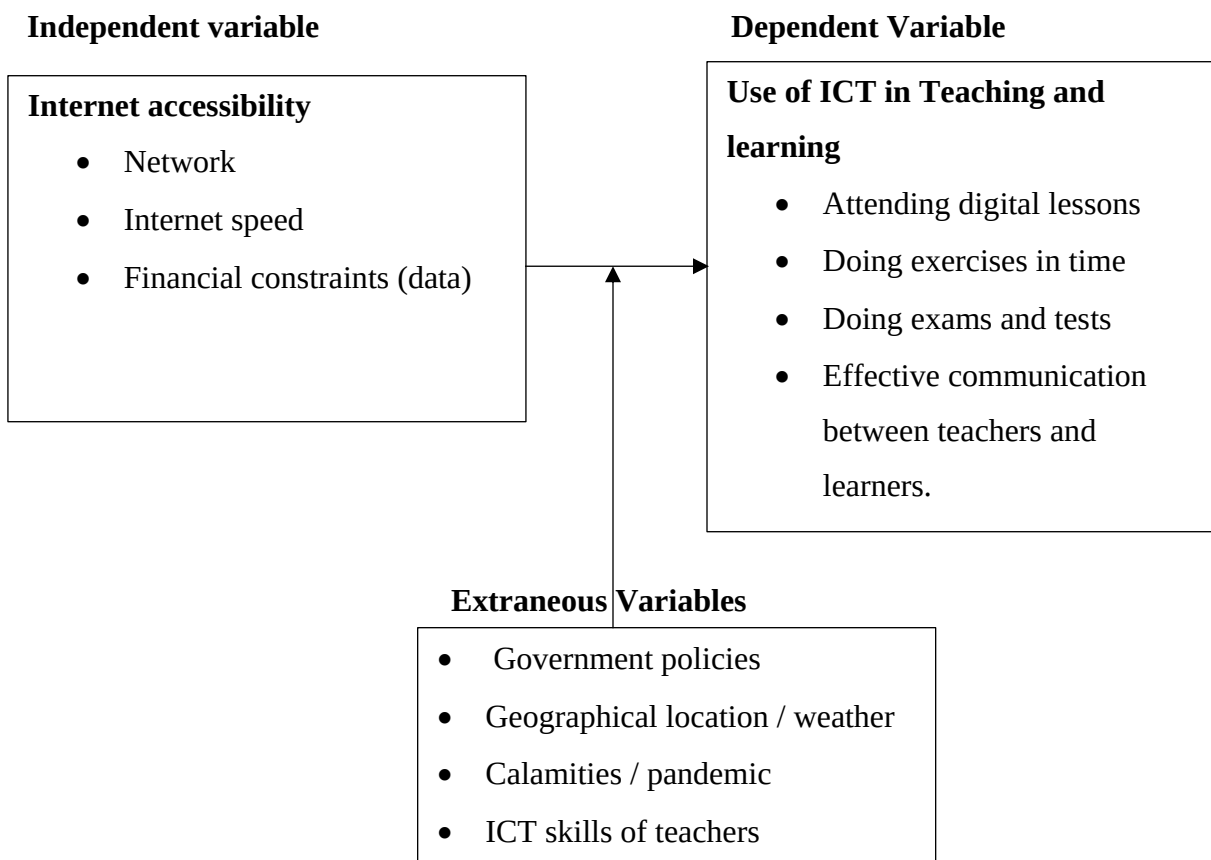
The findings from this study will aim to provide a plan for improving the quality of ICT in teaching and learning and increase the level of satisfaction among teachers and students.

The study findings will contribute to the body of knowledge and aims to guide stakeholders who are involved either directly or indirectly in implementing, planning, or projecting use of ICT in education in secondary schools.

The school administrators may use the study findings to implement decisions about engagement strategies into lessons currently under their direction.

The education stakeholders may also be able to use the findings of this study to develop guidelines for the design and delivery of lessons using ICT.

Conceptual frame work



Source: Developed by the Researcher

The above conceptual framework is about internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District consists of three key components: independent variables, dependent variables, and extraneous variables. The independent variables include network quality, internet speed, and financial constraints related to data. These factors are believed to influence the dependent variable, which is teaching and

learning. Teaching and learning, in this context, encompass attending digital lessons, timely completion of exercises, performance in exams and tests, and the effectiveness of communication between teachers and learners in an digital learning environment. Additionally, the study acknowledges extraneous variables, including government policies, geographical location and weather, and unforeseen calamities or pandemics, which could indirectly impact the relationship between internet accessibility and ICT use in teaching and learning outcomes. This well-structured framework serves as the foundation for the research design and analysis, facilitating a systematic exploration of the interplay between internet accessibility and education in Sheema District's government aided secondary schools. The independent variable, internet accessibility, is hypothesized to have a positive impact on the dependent variable, teaching and learning. This means that schools with better internet accessibility should be able to provide more effective teaching and learning opportunities for their students.

To control extraneous variables in the study "Internet Accessibility and ICT use in Teaching and Learning in Government aided secondary schools of Sheema District", researcher controlled for government policies by reviewing and documenting existing policies, selected schools from a specific region to minimize geographical variations, monitored weather conditions and had alternative data collection methods in place, conducted the study during a period without major calamities or pandemics, and assessed and controlled for teachers' ICT skills through standardized surveys and training. Additionally, they used random sampling, matching, stratification, and statistical techniques to minimize bias and ensure internal validity.

Chapter Two

Literature Review

Introduction

This chapter give literature review about the influence of internet accessibility and ICT use of ICT in teaching and learning in Secondary Schools. It is presented according to study objectives.

Theoretical Review

The study applied the Expectancy Value Models of Motivation, originally developed by John William Atkinson in 1962. These models provided insight into what students value and believe within the educational setting. Chen (2010) identified three key expectancy factors: causal attributions, implicit theories of ability, and self-efficacy. When students could link their efforts to their success, their self-esteem improved. Hood, Creed & Neumann (2012) emphasized that motivation is critical in online learning environments, with motivated students experiencing more engaging learning as they spend more time interacting with the course material. Therefore, it is important to examine the impact of internet access and ICT use on teaching and learning in government aided secondary schools.

The extent of internet access and ICT use for teaching and learning in government aided secondary schools

A cross-sectional study found that the internet is one of the many sources students and teachers may use in searching for information; it helps students access the latest information of certain subjects which they are undertaking (Nuraisyah, Harahap, & Harahap, (2021). One of the major benefits of the internet in education is its function in e-learning. The use of Internet in

secondary schools should concentrate on improving students on education outcomes in paying attention on their curriculum-specific contexts. Additionally, another study noted that by providing internet access and enhancing its usage in schools, a chance to improve students' learning knowledge through access to the huge amount of information that is accessible on the Internet is granted (Kurniasih, Rhefhansha, Wajdi, Haluti, Sari, Manurung, & Mudjanarko, 2018).

Similarly, another study found that, majority of students who were using internet services used it for assignments preparations. Their studies also indicated that most of students believed that the use of Internet services was suitable and far much better than their school libraries (Adnan & Anwar, 2020). The students established Internet services as the source of general knowledge since it really assisted them in their reading habits as well as improving their academic performances. With the rapid change in technologies many people are now using their mobile phones to access information for academic purposes.

In a similar way, access to internet in schools is a necessary condition to the integration of ICT in teaching and learning (Gil-Flores, Rodríguez-Santero & Torres-Gordillo, 2017). Shortage of resources includes different factors, such as lack of access to hardware and software, poor quality hardware and inappropriate software. Effective adoption and integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware, software, etc.

According to Chaudhari, Menon, Saldanha, Tewari, & Bhattacharya (2015), the use of internet by students, particularly for academic purposes, is hugely influenced by their teachers. Students will only use the internet if the work given to them by their teachers is vital for them to use internet facilities. Internet services are used for purposes such as messaging (emails) as well as browsing and downloading sports and other entertainment issues, while females use internet

services to search for new fashion in clothes and series downloading. Chaudhari, Menon, Saldanha, Tewari & Bhattacharya (2015) further pointed out that the use of internet services for academic purposes was ranked second to the use of mails.

If teachers cannot access ICT resources, then they will not use them. Access to computers, updated software, and hardware are key elements to the successful adoption and integration of technology. Lack of access to resources, including access to computers in schools, is another complex barrier that discourages teachers from integrating new technologies into classrooms. A study by Badia, Meneses, & Sigalés (2013) found that access to technological resources is one of the effective ways to promote teachers' pedagogical use of ICT in teaching.

Furthermore, a study by Ravizza, Uitvlugt, & Fenn (2017) reported that the majority of students are not aware that the Internet is a tool for searching digital academic information. They continued by saying that despite a few being aware of the Internet as a searching tool, skills in searching electronic information resources are still a problem. In a nutshell, lack of awareness in using Internet services as a supplement tool for the available school libraries is another problem facing students.

Additionally, the use of the internet grants its users great awareness of the importance of the world around them. The internet is a platform for several types of information (Atzori, Iera, & Morabito, 2017). It is used by students, including secondary students. Internet usage will continue to grow as long as its users are not denied easy access. Recent statistics indicate that the internet gives people the option to access information sites as well as other sites such as social media sites, internet games, and cyber-pleasure.

A mixed study found that many of the students were not using internet services for issues pertaining to education (Dittmar & Eilks, 2019). Their results showed that the students were using the internet for communication purposes such as email and Facebook. Some students were using internet services for pornographic viewing, which is an obvious misuse of the internet facility in an academic background.

In addition a cross-sectional study noted that individuals' personal characteristics could manipulate ones use of internet services. The probability of internet utilization is expected to decline with the age of the users. Spada, (2014) indicated that students users are more likely to have reasonably more exposure to Internet services and therefore more certain in their ability to gain from it. But this will only be possible if these young users are educated. However, it was observed that most of parents believe that their children need internet services for information searching. This depicts that there is very small doubt as to the increase and recognition of internet use among secondary school students in search for academic materials.

Additionally, access to computers in schools & internet connection contributes to students' academic performance as well as self-learning skills. Considering access & usage of the internet by secondary school students in Nigeria, Nwana (2012) indicated that most students believed the internet to be far better & more convenient than their school libraries.

A study by Kaggwa (2015) in Uganda found that only 12% of government aided secondary schools had internet access, & even in those schools, the internet was often slow & unreliable. The study also found that the majority of teachers (70%) had not received any training on how to use ICT for teaching & learning. Another study by Muyinda, Kaggwa, & Ssekakubo (2017) in Uganda found that while 60% of government aided secondary schools had computers, only 20% had

internet access. The study also found that the majority of teachers (80%) used ICT for administrative purposes rather than for teaching & learning.

A research gap exists in realizing the potential of employing a mixed-methods research design, which combines both quantitative and qualitative data collection and analysis methods, to gain a more holistic understanding of internet accessibility and usage in Sheema District's government aided secondary schools. Furthermore, there is a need to identify synergies and complementary aspects between quantitative metrics and qualitative narratives within the context of this study. Research gaps are evident in terms of conducting contextual research to identify specific challenges and opportunities associated with internet accessibility and utilization in government aided secondary schools within Sheema District, Uganda. Furthermore, limited comparative research has been conducted to discern how the Sheema District context differs from other regions in terms of internet-related challenges and potential solutions.

The level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools

According to Hwang & Wu, (2014), the use of ICT tools such as mobile teaching and learning has been increasing very fast due to the development of mobile technology. Wireless technology offers an excellent platform for libraries and other information centres to serve more learners in the world regardless of their locations. For example, in Africa people are changing directly to mobile technology thereby ignoring the traditional cable based way of telephone communication. Mobile technology in Tanzania has been intensively made much cheaper to everyone even to the students themselves as acquiring bundle for Internet services from the mobile services provider is as cheap as five hundred Tanzania shillings per day (Hwang & Wu, 2014).

Similarly, another study found that utilization of ICT services in education sector is used to minimize the issues that are affecting education sector (Mirzajani, Mahmud, Ayub, & Luan, 2015). One of the benefits of using mobile technology in accessing Internet services is the affordability to many people. It has been pointed out that integrating ICT utilization in education issues is one way of enhancing teaching & learning. The majority of colleges use the internet to provide on-line demonstrations. The use of research materials on the internet was ranked fourth (17.3%).

Additionally, while the aim of ICT integration is to improve & increase the quality, accessibility & cost-efficiency of the delivery of instruction to students (Al-Ansi, Suprayogo, & Abidin, 2019), it also refers to benefits from networking the learning communities to face the challenges of current globalization. The process of adoption of ICT is not a single step, but it is ongoing & continuous steps that fully support teaching & learning & information resources.

The above study findings are consistent with a cross-sectional study which found that ICT provides the help & complementary supports for both teachers & students where it involves effective learning with the help of the computers to serve the purpose of learning aids (Ghavifekr & Rosdy, 2015). As with ICT more generally, direct casual effects are not easily identifiable. Furthermore, drawing clear conclusions on the effect of ICT from the range of research evidence & studies can be problematic. There are a number of factors that limit effective comparison, such as differences in sample size, methodologies & effects, not to mention many differences between education systems in different countries.

The use of the ICT tools for searching for research materials was ranked second (53.4%) & the use of the internet for e-mail purposes was ranked first (69.9%) in European high schools. The use of the ICT for academic research would significantly improve through the provision of

more access points at the departmental & faculty levels (Odigwe & Owan, 2020). The optimal utilization of computer equipment in institutions of higher learning remains an argument among scholars & computer experts.

Similarly Chirwa, (2018) observes that the introduction of computers in education has not revolutionized education and that a great deal of computer equipment which are worth millions and purchased by educational institutions such equipment become obsolete. Technology integration nowadays has gone through innovations and transformed our societies that has totally changed the way people think, work and live. This is due to the capability of ICT in providing dynamic and proactive teaching-learning environment.

Additionally, a mixed study found that effectiveness of ICT in education generally means technology-based teaching and learning process that closely relates to the utilization of learning technologies in schools (Ghavifekr & Rosdy, 2015). Due to the fact that students are familiar with technology and they will learn better within technology-based environment, the issue of ICT integration in schools, specifically in the classroom is vital. This is because, the use of technology in education contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and supports from ICT elements and components.

A study by Muyinda (2018) in Uganda found that the use of ICT in teaching and learning had a positive impact on student learning outcomes, particularly in subjects such as mathematics and science. However, the study also found that the effectiveness of ICT use was hindered by factors such as lack of technical support and inadequate infrastructure. Another study by Ssekakubo (2016) in Uganda found that the use of ICT in teaching and learning had a significant impact on student engagement and motivation. However, the study also found that the

effectiveness of ICT use was dependent on factors such as teacher training and the availability of ICT resources.

There is a research gap in fully leveraging a mixed-methods research design, which integrates both quantitative and qualitative data collection and analysis, to provide a more comprehensive understanding of internet accessibility and usage in government aided secondary schools in Sheema District. Additionally, there is a need to explore the synergies and complementary aspects between quantitative data and qualitative insights in this study's context. Gaps also exist in conducting contextual research that identifies the specific challenges and opportunities related to internet access and use in Sheema District's government aided secondary schools. Moreover, limited comparative studies have been undertaken to understand how Sheema District's internet-related challenges and potential solutions differ from those in other regions.

The relationship between Internet accessibility and ICT use in teaching and Learning in Secondary schools

The emergence of the internet in education has a tremendous impact on teaching & learning. Properly used information from the Internet represents added value to education (Ryan, Zhang, & Chapman, 2013). Given the government's limited financial & human resources, it necessitates high use of ICT resources to replace expensive printed educational resources. UNESCO (2013) pointed out that information retrieval, individualized learning, group learning, & collaborative activities would greatly be enhanced in education through the use of the Internet.

ICTs & Internet use provide new ways of communication that simplify social interaction among people & learning, as people can communicate & learn from one another from a distant place, country, & continent through various social networking platforms. Moreover, effective use

of the Internet in teaching & learning can bring changes that would lead to not only pedagogical improvement but also save time & space. Metzger & Flanagin (2013) found that there was a stronger relationship between perceived usefulness & usage than perceived ease of use & usage.

Recognizing that these factors may vary depending on the reasons for which students use the Internet plays an important role in arguing about the reliability of the results of the studies that look into the reasons for which students use the Internet. According to Yeboah & Ewur (2014), internet usage has a positive impact on teaching & learning. They opined that students who tend to use the internet more on educational materials are less likely to fail their examinations. Therefore, the disadvantages of lack of access to the internet surpass the advantages. Also, people who perform interactive activities with peers & teachers or when they make a balance use of internet tools for their course work tend to have greater academic performance.

Similar results have been obtained by Akomolafe & Adesua (2016) when they evaluated the impact of internet usage among secondary school students in Nigeria. Psychological issues ranging from mood swings to altered behavior, withdrawn attitude, & loneliness have been reported by Singh, Kaur, & Kaur (2013) to be the main effect of using the internet mainly for social networking & mailing. This is because they remain in some sort of virtual world of the net.

Students who were in the severe & profound group of internet addiction were found to have a detrimental effect on their academic performance & mental health rather than the students who use the internet moderately (Yebowaah, 2018). Similarly, results have been obtained by Vigdor, Ladd, & Martinez (2014) in their study that categorized internet users into light, moderate, & intense users respectively. Students that use the internet at school (moderate use) produce higher grades than those that do not use the internet. Also, students that only use the internet at school (light users) obtained lower grades compared to those that did not use the internet.

A study by Ssekakubo (2016) in Uganda found that there was a significant relationship between ICT use & student learning outcomes. The study found that students who used ICT regularly performed better in subjects such as English & mathematics compared to those who did not use ICT. Another study by Katusiimeh (2018) in Uganda found that the use of ICT in teaching & learning had a significant impact on teacher-student interaction & student-teacher communication. The study found that teachers who used ICT regularly were more likely to engage with students & provide feedback compared to those who did not use ICT.

There is a need to examine how quantitative findings and qualitative perspectives can complement each other in this context. Furthermore, there is a lack of contextual research aimed at identifying the specific challenges and opportunities related to internet access in Sheema District's government aided secondary schools. In addition, few comparative studies have been conducted to highlight how internet-related issues and solutions in Sheema District differ from those in other regions.

Chapter Three

Methodology

Introduction

This chapter presents the methodology that was the basis of this proposed study. The chapter covered the research design, study population, sample size and selection, sampling selection, data collection methods, data collection instruments, procedure of data collection, reliability and validity of instruments, data analysis and measurement of variables.

Research Design

This study employed a cross-sectional research design where both quantitative and qualitative approaches were used. The cross-sectional survey design involved gathering data that described events and then organizing, tabulating, depicting, and describing the data collection. The cross-sectional design involved asking a large group of respondents' questions about a particular issue. The designs were preferred because they were easy to apply research instruments such as questionnaires, which allowed for the collection of data from a large number of respondents in a relatively short period. The cross-sectional research design was appropriate for the study because it allowed for the collection of data at a single point in time from a diverse sample of participants. According to Creswell (2014), cross-sectional research design provides a snapshot of a particular population, enabling researchers to examine relationships between variables and identify patterns or trends.

Area of Study

The study was carried out in government aided secondary schools of Sheema District. Government aided secondary schools in Sheema District were selected because, according to the report (Sheema District Statistical Abstract, 2021), though secondary schools had adopted several measures from the influence of internet accessibility and ICT use of ICT in teaching and learning, they were currently not matching with the resources employed. The area was chosen for the study because secondary schools in Sheema District had neglected ICT use in teaching and learning, which ensured effective teaching and learning due to lack of facilities such as software tools and high cost of internet, inadequate network access.

Study Population

The population of the study was 812, comprising 12 headteachers from 12 government aided secondary schools, 360 teachers, and 600 A' level students. However, owing to time and cost constraints, the researcher considered the sampled population that was representative enough. The sampled population was from Secondary schools. Headteachers participated in the study because they were responsible for administering and implementing effective teaching and learning. Teachers and students were considered to participate in the study because they had detailed information about use of ICT in teaching and learning and its implementation. Advanced level students participated in the study because they are typically older and have more experience with technology and the internet compared to lower-level students and their level of study requires more use of internet and technology.

Table 3.1: Showing study population

Category	Study Population	Sample size
Head teachers	12	12
Teachers	360	120
Students	600	151
Total	972	283

Sample Size

A sample refers to a small portion of the respondents from which the researcher selected for observation (Omari, 2011). The researcher used a sample size of 283 respondents that was determined using the formula of Yamane (1967) as illustrated below. The sample from each of the categories was determined using proportionate sampling.

$$n = \frac{N}{1 + N(e)^2}$$

n = sample size

N = the total population

e = margin error and it usually ranges from (0.01- 0.05)

$$n = \frac{972}{1 + 972(0.05)^2}$$

= 283 respondents

Sampling Techniques

Selection of study area

The researcher purposively selected Government aided secondary schools of Sheema District as the study area, employing non-probability sampling to choose participants. This approach was justified due to the accessibility and feasibility of data collection, representation of typical cases, limited resources, and the need to focus on specific characteristics. Purposive sampling allowed the researcher to select a sample rich in information, relevant to the research question, and feasible to access, contributing to the study's validity and reliability.

Selection of participants

Two techniques of sampling were used, namely simple random sampling and purposive sampling (Saunders, Lewis, & Thornhill, 2012). Simple random sampling, where each individual had equal chances of being selected as a participant in the study, was employed for the selection of teachers and students to prevent bias. Stratified sampling was initially used to divide the teachers and students according to gender, and then a fishbowl method was used to obtain an equal number of respondents from each gender strata (Saunders, Lewis, & Thornhill, 2012). Headteachers of Secondary Education Schools were selected using purposive sampling due to their relevant information about the influence of internet accessibility and the use of ICT in teaching and learning in secondary schools of Sheema District, as they played a role in the implementation process.

Data Collection Methods

The study used two data collection methods: a questionnaire survey and interviews.

Research Questionnaire Survey

The questionnaire survey method was used to collect data from teachers and students. It included close-ended questions and was chosen for its efficiency in collecting data from a large number of respondents in a relatively short period.

Interview Method

The interview method was used to collect data from headteachers. It provided quantitative data by allowing the researcher to collect details of the respondent's answers on the study variables. Interviews provided in-depth information necessary for deeper exploration and clarity.

Data Collection Instruments

The study employed both a self-administered questionnaire and an interview guide as data collection instruments.

Self-administered Questionnaire

The self-administered questionnaire was used as the quantitative data collection instrument. It enabled respondents (teachers and students) to take their time to understand the questions and provide thoughtful answers, thus improving the quality of responses.

Interview Guide

An interview guide was used to collect quantitative data. The design of the interview items was standardized with closed-ended questions. Headteachers were asked similar questions, but the responses were open-ended to elicit more detailed information.

Research Procedure

The researcher obtained an introductory letter from Bishop Stuart University Research Ethics Committee and presented it to the faculty dean of Education. Arts and Media studies Bishop Stuart University for approval to collect data. After obtaining the approval letter from the REC, permission was sought from the district education officer of Sheema District to conduct research in selected Secondary Schools. Once permission was granted, the researcher proceeded to the schools, presented the authority letter to the headteacher, and requested the required participants' cooperation. The researcher followed the program given by the headteacher, administered questionnaires personally to the respondents, and collected them after completion.

Data Quality Control

Data quality control was ensured by calculating the validity and reliability of the instruments.

Validity of the Instruments

The validity of the research instruments was determined using the Content Related Evidence of Validity method. Two knowledgeable persons about the study topic were asked to independently inspect the items and link each objective with the respective item. They rated each item on a 4-point scale, assessing its relevance to the content addressed by the objectives. The

level of agreement on the items between the two knowledgeable persons was computed as inter-rater agreement (Saunders, Lewis, and Thornhill, 2012).

$$CVI = \frac{\text{Number of items rated quite relevant and very relevant}}{\text{Total number of items in the questionnaire}}$$

$$CVI = \frac{n}{N}$$

Where:

CVI = Content Validity Index,

n = Number of items rated relevant

N = Total number of items in the questionnaire.

$$CVI = 28/30$$

$$CVI = 0.93$$

This implies that the instruments were validity because according to Amin (2005) CVI above 0.7 qualifies the instrument to be used.

Reliability of instruments

Reliability refers to the consistency of measurement, that is, the extent to which the results are similar from different forms of the instrument. A split-half reliability method was used to determine the reliability of instruments. The researcher administered the instrument to the teachers, and the items in the instrument were divided into two halves, the odd and the even-numbered items. Scores from the odd and even items were computed for each instrument. The two sets of

scores were then correlated using Pearson coefficient correlation in SPSS. The results scored 0.86 which was above 0.7 implying that instruments were reliable.

Data Analysis

Data were analyzed using quantitative data analysis methods, as explained below:

Qualitative Data Analysis

Qualitative data from objectives one and two were analyzed using a thematic analysis approach, involving a series of steps: familiarization with the data through repeated readings, coding using a combination of inductive and deductive approaches, editing to ensure consistency and accuracy, classification into categories and subcategories, theme identification, and theme interpretation in relation to the research questions and existing literature. This approach allowed for a rich exploration of the participants' experiences, perceptions, and perspectives, providing a detailed understanding of the research phenomena.

Quantitative Data Analysis

Quantitative data from objective three were summarized and entered into the SPSS data analysis program. Pearson product-moment correlation coefficient was used to determine the relationship between variables.

Measurement of Variables

Measurement of the variables was based on the nominal and ordinal scales. The nominal scale was used to measure questions on demographic characteristics, as it helps label or tag study items for identification. The ordinal scale, a ranking and order scale, was used to measure the items

of the independent and dependent variables. The scale helped distinguish between objects according to a single attribute and direction. The ranking was a five-point Likert Scale (where 5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree, and 1 = Strongly Disagree).

Ethical Considerations

The researcher maintained a high level of ethics throughout the whole research process. Material obtained from other sources, such as journal articles and books, were acknowledged. Approval was sought from Bishop Stuart University Research Ethics Committee to collect data from the field. The respondents were informed as to why and how they were chosen, and each questionnaire contained an opening introductory letter requesting the respondent's cooperation in providing the required information for the study. Respondents were further assured of the confidentiality of the information they provided and the purposes of the study findings. Anonymity was ensured, and the researcher observed confidentiality while handling the responses. Respondents were informed that the research would not endanger them directly or indirectly and that participation was voluntary. During data management and analysis, the findings were associated with respondents through a coding system.

Chapter Four

Data Presentation, Analysis and Interpretation

Introduction

This chapter provides a clear and detailed overview of the data obtained during the study. It involves the systematic organization and presentation of the data in a coherent manner, making it easier for readers to comprehend the findings. The data analysis undertaken in this chapter plays a crucial role in addressing the research questions and objectives. It provides evidence-based support for the study's hypotheses and aids in validating or refuting the proposed theoretical framework.

Table 4.1: Response Rate

Group	Number of participants	Number of respondents	Response rate
Head teachers	12	12	100%
Teachers	120	118	98.3%
Students	151	132	87.4%
Total	283	262	92.6%

Source: Field Data November (2023)

The total number of participants across all groups was 283. Out of the 283 participants, 262 responded to the research survey or questionnaire. The overall response rate is calculated as $(262/283) * 100 = 92.6\%$. This indicates that the majority of participants, across all groups, provided responses for the research study. A high response rate suggests a strong level of participation and engagement from the target population.

Background Information

This included age (years), gender, and level of education

Table 4.2: Respondents' Background information

Background information	Teachers and head-teachers N=130		Students N=132	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age (years)				
12-15	-	-	57	43.2%
16-19	-	-	75	56.8%
20-29	40	30.8%	-	-
30-39	65	50.0%	-	-
40 and above	25	19.2%	-	-
Gender				
Male	75	57.7%	65	49.2%
Female	55	42.3%	67	50.8%
Level of education				
Diploma	20	15.4%	-	-
Degree	70	53.8%	-	-
Postgraduate	40	30.8%	-	-
S.5	-	-	30	22.7%
S.6 (Art class students)	-	-	45	34.1%
S.6 (Science class students)	-	-	57	43.2%

Source: Field Data November (2023)

From Table 4.2, regarding the age distribution of the participants, the students' age range was categorized as follows: 43.2% of the students fell within the age group of 12 to 15 years, while a larger proportion of 56.8% belonged to the age group of 16 to 19 years. The study also looked at the gender distribution among the participants. Among the students, there was a nearly equal

distribution, with 49.2% being male and 50.8% being female. Among the teachers and head-teachers, 57.7% were male, while 42.3% were female. Regarding the level of education of the participants, among the students, 22.7% were in S.5, 34.1% were in S.6 (Art class students), and the largest proportion of 43.2% were in S.6 (science class students). In comparison, among the teachers and head-teachers, 15.4% held a Diploma, 53.8% held a Degree, and 30.8% possessed a Postgraduate qualification.

The extent of internet access and ICT use for teaching and learning in government aided secondary schools

This section presents data in relation to first objective which stated to determine the extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District. Descriptive statistics such as frequencies, percentages and mean scores were generated as shown in Table 4.3.

Table 4.3: Respondents' responses regarding the extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District

Items	1	2	3	4	5	Mean
	f(%)	f(%)	f(%)	f(%)	f(%)	Score
The network for internet is always available	10 (4%)	25 (10%)	40 (16%)	100 (40%)	75 (30%)	3.82
There is enough data for internet	15 (6%)	30 (12%)	50 (20%)	95 (38%)	60 (24%)	3.62
The speed of internet is fast during surfing	20 (8%)	40 (16%)	60 (24%)	85 (34%)	45 (18%)	3.38
I afford the costs of data	30 (12%)	55 (22%)	40 (16%)	85 (34%)	40 (16%)	3.20

The availability of electricity at school	5 (2%)	20 (8%)	30 (12%)	90 (36%)	105 (42%)	4.08
Overall Mean Score						3.62

1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5=Strongly Agree, F=frequency

Source: Field Data November (2023)

From Table 4.3 above, regarding the availability of the internet network, a significant majority of 40% of the respondents agreed that the network for internet was always available. This result indicated that a considerable proportion of students had access to a reliable internet connection while attending school. On the other hand, only a small percentage of 4% of the participants strongly disagreed with this statement, suggesting that there were some challenges faced by a minority of students in terms of consistent internet connectivity. In terms of data sufficiency, 38% of the respondents agreed that there was enough data for internet usage in their schools. This finding implied that a substantial number of students had access to sufficient data to support their ICT activities. However, 6% of the participants strongly disagreed, indicating that a minority of students expressed concerns about data insufficiency, which may affect their ability to fully utilize internet resources for learning.

Concerning the speed of internet during surfing, 34% of the respondents agreed that the internet speed was fast. This result suggested that a significant proportion of students experienced satisfactory internet browsing and ICT interactions, while only 8% of the participants strongly disagreed, indicating that a small fraction of students faced challenges with slow internet speeds while accessing digital content. When it came to the affordability of data, 34% of the respondents agreed that they could afford the costs. This finding indicated that a significant number of students had the financial means to access internet services. However, 12% of the participants strongly

disagreed, suggesting that a minority of students faced financial constraints in paying for internet data, which might limit their access to ICT educational resources.

In terms of electricity availability at schools, a substantial majority of 42% of the respondents agreed that they had access to electricity. This result implied that a significant number of students had the means to utilize internet services beyond school hours. Only a small percentage of 2% of the participants strongly disagreed, indicating that a minority lacked access to electricity at their schools, which could potentially hinder their ability to use the internet for educational purposes outside of school. The overall mean score of 3.62 suggested that, on average, students' responses leaned towards agreement regarding various aspects of internet accessibility in Secondary schools of Sheema District. This mean score indicated that the majority of students had positive perceptions about the availability of the internet network, data sufficiency, internet speed, affordability of data, and the availability of electricity at school. While a significant majority of students reported positive experiences, the findings also highlighted some challenges faced by a minority, including issues with network availability, data sufficiency, affordability, and electricity access.

In addition, the above findings were consistent with findings from interviews as responses presented below;

One of the respondents said that; *“Internet access is a major challenge for our school. We have limited network coverage and slow internet speed, which makes it difficult for our students to attend digital lessons, digital libraries, online books and complete their assignments on time”*. (Headteacher 1).

Another respondent noted that; *“We have been able to overcome some of the challenges of internet access by investing in solar power (although it is not reliable) and backup generators. This has helped us to ensure that our students have access to the internet even when there are power outages. (Headteacher 2).*

Another respondent noted that; *“We have partnered with local internet service providers to provide affordable data packages to our students. Although it is costly in terms of network coverage, data subscription, internet speed, and hardware accessories (Headteacher 3).*

Another respondent said that; *“Our school have had to adapt our teaching methods to accommodate the challenges of internet access. We have also started using offline resources such as textbooks and workbooks to supplement our digital lessons”. (Headteacher 4).*

Another respondent mentioned that *“The pandemic COVID-19 highlighted the importance of internet access for teaching and learning. The school management had to invest in new technologies and training for teachers to ensure that students can continue to learn even when they cannot attend school in person, although we still have the challenge of internet access for teaching and learning processes”. (Headteacher 5).*

Another respondent noted that *“Government policies have a significant impact on internet access and ICT use for teaching and learning. We need more support from the government to ensure that all students have access to the internet and the necessary resources to learn effectively. Geographical location and weather can also affect internet access. In some parts of our district, network coverage is limited due to the geographical land scape, reliable power supply and low economic status of the school. (Headteacher 6).*

Another respondent mentioned that *“We have had to work closely with parents and guardians to ensure that they understand the importance of internet access for their children’s education. We have provided them with information on how to access the internet and how to support their children’s learning. We are constantly looking for new ways to improve internet access and ICT use for teaching and learning. We are also exploring new technologies and partnerships to ensure that our students have the best possible learning experience”*. (Headteacher 7).

The above study findings imply that the study found that internet accessibility in government aided secondary schools in Sheema District is generally positive, with a significant majority of respondents reporting positive perceptions about the availability of the internet network, data sufficiency, internet speed, affordability of data, and the availability of electricity at school. However, the findings also highlighted some challenges faced including issues with network availability, data sufficiency, affordability, and electricity access. The interview findings corroborate the survey findings, with headteachers reporting that internet access is a major challenge for their schools, but that they are working to overcome these challenges by investing in solar power, backup generators, partnerships with internet service providers, and adapting teaching methods.

The level of use of ICT in teaching and learning in Secondary schools of Sheema District

This section presents data in relation to second objective which stated to determine the level of effectiveness of use of ICT in teaching and learning in government aided secondary schools of Sheema District. Descriptive statistics such as frequencies, percentages and mean scores were generated as shown in Table 4.4.

Table 4.4: Respondents responses regarding the level of use of ICT in teaching and learning in Secondary schools of Sheema District

Items	1 f(%)	2 f(%)	3 f(%)	4 f(%)	5 f(%)	Mean Score
ICT enables teachers and students to be more creative and imaginative during teaching and learning	10 (4%)	25 (10%)	35 (14%)	110 (44%)	70 (28%)	3.82
The use of ICT helps teachers and students find related knowledge and information for teaching and learning	15 (6%)	30 (12%)	45 (18%)	65 (26%)	95 (38%)	3.78
The use of ICT encourages teachers to communicate more with their learners	20 (8%)	40 (16%)	55 (22%)	80 (32%)	55 (22%)	3.44
The use of ICT increases teachers and students' confidence to participate actively in the class	30 (12%)	40 (16%)	50 (20%)	60 (24%)	70 (28%)	3.40
Students learn more effectively with the use of ICT and teachers teach more effectively	25 (10%)	35 (14%)	45 (18%)	55 (22%)	90 (36%)	3.60
The use of ICT helps to broaden student and teachers' knowledge paradigm	10 (4%)	20 (8%)	30 (12%)	100 (40%)	90 (36%)	3.96
The use of ICT helps to improve student and teachers' ability specifically in teaching, reading, and writing	15 (6%)	25 (10%)	35 (14%)	80 (32%)	95 (38%)	3.86
Students are more behaved and under control with the use of ICT when teachers are teaching	20 (8%)	30 (12%)	40 (16%)	70 (28%)	90 (36%)	3.72
The use of ICT enables students to express their ideas and thoughts better with their teachers	25 (10%)	35 (14%)	45 (18%)	70 (28%)	75 (30%)	3.54
The use of ICT promotes active and engaging lessons for students and	15 (6%)	20 (8%)	30 (12%)	100 (40%)	85 (34%)	3.88

teachers' best teaching and learning
experience

Overall mean score

3.70

1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5=Strongly Agree, F=frequency

Source: Field Data November (2023)

From the Table above, regarding the first item, "ICT enables teachers and students to be more creative and imaginative during teaching and learning," a significant majority of 44% of the respondents agreed that ICT played a pivotal role in enhancing creativity and imagination in the educational process. This result indicates that a considerable proportion of participants recognized the potential of ICT to stimulate creative thinking during lessons. Conversely, only a small percentage of 4% of the participants strongly disagreed with this statement, suggesting that there were a few individuals who did not perceive a significant impact of ICT on creativity and imagination.

Moving on to the statement, "The use of ICT helps teachers and students find related knowledge and information for teaching and learning," the findings revealed that 38% of the respondents agreed with this claim. This result implied that a considerable number of participants valued the ability of ICT to facilitate knowledge acquisition and information retrieval. Conversely, only 6% of the participants strongly disagreed, suggesting that only a minority expressed doubts about the effectiveness of ICT in supporting knowledge exploration. Regarding the statement, "The use of ICT encourages teachers to communicate more with their learners," approximately 32% of the respondents agreed that ICT fostered increased communication between teachers and students. This finding suggested that a considerable number of participants perceived positive effects of ICT on teacher-learner communication. However, only 8% of the participants strongly

disagreed, indicating that a minority did not observe substantial improvements in communication through the integration of ICT.

Furthermore, the statement "The use of ICT increases teachers and students' confidence to participate actively in the class" received agreement from 28% of the respondents. This result implied that a significant proportion of participants recognized the role of ICT in promoting classroom engagement. Conversely, 12% of the participants strongly disagreed, suggesting that a minority expressed reservations about the effectiveness of ICT in enhancing active participation in the class. In terms of the statement, "Students learn more effectively with the use of ICT and teachers teach more effectively," 36% of the respondents agreed, indicating that a considerable majority perceived positive outcomes regarding the effectiveness of ICT in the teaching-learning process. Conversely, only 10% of the participants strongly disagreed, suggesting that only a small minority had reservations about the impact of ICT on learning and teaching effectiveness.

Moving on to the statement, "The use of ICT helps to broaden student and teachers' knowledge paradigm," a significant majority of 36% of the respondents agreed. This finding suggested that many participants recognized the value of ICT in expanding their understanding of various subjects and topics. Conversely, only 4% of the participants strongly disagreed, indicating that only a small fraction expressed skepticism about the impact of ICT on knowledge enhancement. Regarding the statement, "The use of ICT helps to improve student and teachers' ability specifically in teaching, reading, and writing," 38% of the respondents agreed. This result indicated that a significant number of participants perceived positive effects on their educational skills through the integration of ICT. Conversely, only 6% of the participants strongly disagreed, suggesting that a minority of students did not observe improvements in their teaching and learning abilities through the use of ICT.

Concerning, "Students are more behaved and under control with the use of ICT when teachers are teaching," approximately 36% of the respondents agreed. This finding suggested that many participants perceived positive behavioral effects associated with the use of ICT in the classroom. Conversely, only 8% of the participants strongly disagreed, indicating that only a small fraction did not observe improvements in student behavior through ICT integration. Regarding the statement, "The use of ICT enables students to express their ideas and thoughts better with their teachers," 30% of the respondents agreed. This implied that many participants recognized the potential of ICT to facilitate communication between students and educators. Conversely, only 10% of the participants strongly disagreed, suggesting that only a small minority did not observe improvements in communication through the use of ICT.

Finally, concerning "The use of ICT promotes active and engaging lessons for students and teachers' best teaching and learning experience," received agreement from 34% of the respondents. This finding indicated that many participants recognized the role of ICT in enhancing classroom interactivity and the overall educational experience. Conversely, only 8% of the participants strongly disagreed, suggesting that only a small minority did not observe improvements in lesson engagement through ICT integration. The overall mean score of 3.70 suggested that, on average, participants' responses leaned towards agreement regarding the various aspects of use of ICT in teaching and learning through ICT in Secondary schools of Sheema District. This mean score indicated that the majority of participants had positive perceptions about the impact of ICT on creativity, knowledge acquisition, communication, engagement, and teaching effectiveness. The above study findings imply that a significant majority of participants recognized the benefits of ICT in fostering creativity, knowledge acquisition, communication, engagement, and overall teaching and learning effectiveness.

Additionally from interviews different arguments were revealed concerning the level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools of Sheema District as presented in responses below;

One of the respondents mentioned that *“We have seen a significant improvement in the effectiveness of teaching and learning since we started using ICT. Our students are more engaged and motivated, and their insight in learning has improved”*. (Headteacher 1).

One respondent noted that *“The effectiveness of ICT in teaching and learning depends on the level of training and support that teachers receive. We have invested in training programs and workshops to ensure that our teachers are equipped with the necessary skills to use ICT effectively* (Headteacher 2).

Another respondent mentioned that *“ICT has helped us to overcome some of the challenges of traditional teaching methods, such as limited resources and lack of access to information. With ICT, our students have access to a wealth of information and resources that they can use it to enhance their learning”*. (Headteacher 3).

Another respondent mentioned that *“The effectiveness of ICT in teaching and learning also depends on the availability of resources such as computers, internet connectivity, and software. We have had to invest in these resources to ensure that our students have access to the necessary tools for learning.*(Head teacher 4).

Another respondent noted that *“The effectiveness of ICT in teaching and learning also depends on the policies and guidelines set by the government. We need more support from the government to ensure that we have access to the necessary resources and infrastructure to use ICT effectively”*. (Headteacher 5).

Another respondent noted that *“ICT has helped us to create a more interactive and collaborative learning environment. With ICT tools and platforms, our students can work together on projects and assignments, and share their ideas and knowledge”* (Head teacher 6).

Another respondent revealed that *“The effectiveness of ICT in teaching and learning is an ongoing process. We are constantly evaluating our methods and strategies to ensure that we are using ICT effectively and providing our students with the best possible learning experience”*(Headteacher 7).

The above study findings imply that the majority of participants had positive perceptions about the impact of ICT on creativity, knowledge acquisition, communication, engagement, and overall teaching and learning effectiveness in secondary schools in Sheema District. The mean score of 3.70 suggested that participants generally agreed with the various aspects of teaching and learning through ICT. The interview findings corroborate the survey findings, with headteachers reporting that ICT has had a positive impact on teaching and learning in their schools. However, they also noted that the effectiveness of ICT depends on a number of factors, including teacher training, availability of resources, and government support.

The relationship between Internet accessibility and ICT use in teaching and Learning in Secondary schools

This section provides results for objective three which aimed to establish the relationship between internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District. This was established using Pearson coefficient correlation as presented in Table 4.5 below.

Table 4.5: Pearson coefficient correlation for Internet accessibility and ICT use in teaching and Learning in Government aided secondary schools of Sheema District

Correlations			
		Internet Accessibility	Teaching and Learning
Internet Accessibility	Pearson	1	0.60**
	Correlation		
	Sig. (2-tailed)		0.001
	N	250	250
Teaching and Learning	Pearson	0.06**	1
	Correlation		
	Sig. (2-tailed)	0.001	
	N	250	250

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field Data November (2023)

The results from Table 4.5 indicated a positive correlation between internet accessibility and ICT use in teaching and learning. The correlation coefficient between internet accessibility and ICT use in teaching and learning was found to be 0.60**. This value suggests a moderate positive relationship between the two variables. The correlation was significant at the 0.05 level (2-tailed), with a p-value of 0.001. This indicates that the observed correlation is unlikely to have occurred by chance, reinforcing the reliability of the relationship. Furthermore, the correlation coefficient for internet accessibility with itself was 1, as expected, indicating a perfect positive correlation. Similarly, the correlation coefficient for teaching and learning with itself was also 1, confirming the perfect positive correlation within each variable. In conclusion, the study found a significant and positive correlation between Internet accessibility and ICT use in teaching and Learning in Government aided secondary schools of Sheema District. This suggests that as

Internet Accessibility increases, there is a tendency for Teaching and Learning to improve in these schools.

Chapter Five

Discussion of Findings, Conclusions And Recommendations

Introduction

This chapter presents the discussion of findings, conclusions, and recommendations derived from the extensive research conducted on Internet accessibility and ICT use in teaching and Learning in Government aided secondary schools of Sheema District. This chapter marks the culmination of the research journey, where the results obtained from data analysis and interpretation are thoroughly examined and critically evaluated. The primary objective of this chapter is to provide a comprehensive discussion of the key findings obtained from the study.

Discussion of findings

The extent of internet access and ICT use for teaching and learning in government aided secondary schools

The results indicated a positive perceptions on internet accessibility, though some challenges were observed for a minority of students with an overall mean score of 3.62. A significant majority of students reported positive experiences with internet availability, data sufficiency, internet speed, affordability of data, and the availability of electricity at school. This indicates that the majority of students had favorable perceptions about their access to internet resources, which contributed to the higher overall mean score.

The findings of the current study regarding internet accessibility and its impact on teaching and learning in Secondary schools of Sheema District are consistent with several previous research studies. For instance, Nuraisyah, Harahap, & Harahap (2021) highlighted the internet as a valuable source of information for students, enabling access to the latest and relevant subject-specific

knowledge. This is particularly important in the context of secondary education, where students are expected to develop a deeper understanding of various subjects. By having access to the internet, students can explore a wide range of resources, including online textbooks, educational websites, and academic journals, which can enhance their learning experiences.

Furthermore, Kurniasih et al. (2018) supported the idea that providing internet access in schools enhances students' learning experiences by granting them access to vast amounts of information available online. This is in line with the current study's findings, which suggest that internet accessibility has a positive impact on teaching and learning in secondary schools. By providing students with internet access, schools can create a more inclusive and engaging learning environment, where students can explore different perspectives and ideas.

Additionally, Dittmar & Eilks (2019) found that students and teachers are the primary users of the internet for academic purposes, reinforcing the significance of internet accessibility in enhancing the educational process. This suggests that internet accessibility is not only important for students, but also for teachers, who can use online resources to develop their teaching practices and create more effective lesson plans. By having access to the internet, teachers can stay up-to-date with the latest developments in their subject areas and incorporate new ideas and technologies into their teaching practices.

Overall, the current study's findings are consistent with previous research, which highlights the importance of internet accessibility in enhancing teaching and learning in secondary schools. By providing students and teachers with access to the internet, schools can create a more inclusive, engaging, and effective learning environment, which can lead to improved academic outcomes and better preparation for the digital age.

The level of the use of ICT in teaching and learning in Secondary schools of Sheema District

The study findings found that on average, the participants' responses leaned towards agreement regarding the various aspects of teaching and learning through ICT in Secondary schools of Sheema District with an overall mean score of 3.70. A significant majority of participants recognized the benefits of ICT in fostering creativity, knowledge acquisition, communication, engagement, and overall teaching and learning effectiveness. The majority's positive perceptions highlight the potential of ICT as a valuable tool in enhancing various aspects of the educational process, contributing to the higher overall mean score.

The above study findings are consistent with the existing literature on the impact of Information and Communication Technology (ICT) on education. For instance, Hwang & Wu (2014) emphasized the rapid growth of ICT tools, particularly mobile technology, in education. The widespread adoption of mobile technology has transformed the way students access educational resources and internet services. The affordability and accessibility of mobile technology have made it a popular choice for accessing internet services and educational resources, especially in regions like Africa, where traditional computer-based internet access may be limited.

Moreover, Mirzajani et al. (2015) highlighted that ICT utilization in education can address various issues affecting the education sector and enhance teaching and learning experiences. This aligns with the study's findings, which suggest that participants recognized the benefits of ICT in fostering creativity, knowledge acquisition, communication, and engagement in the educational process. The use of ICT tools, such as mobile technology, can facilitate personalized learning, improve student-teacher interaction, and increase access to educational resources.

The existing literature also supports the idea that ICT can enhance teaching and learning experiences. For example, Ghavifekr & Rosdy (2015) emphasized the effectiveness of ICT in education, providing support to both teachers and students and contributing to effective learning. Similarly, Al-Ansi et al. (2019) found that ICT adoption is an ongoing process that supports teaching, learning, and information resources in education.

The study's findings also resonate with the work of Chirwa (2018), who noted that technology integration has the potential to revolutionize education and transform societies by offering effective teaching and learning approaches. The use of ICT tools, such as mobile technology, can facilitate the development of 21st-century skills, including critical thinking, problem-solving, and collaboration.

The relationship between internet accessibility and ICT use in teaching and learning in secondary schools

The study findings showed statistically significant correlation at the 0.05 level (2-tailed), with a p-value of 0.001, reinforcing the reliability of the relationship between Internet accessibility and ICT use in teaching and Learning in Secondary schools. The significant correlation suggests that as internet accessibility improves, there is a corresponding improvement in the teaching and learning process in the secondary schools studied.

The above study findings are aligned with the existing literature on the impact of the internet in education. For example, Ryan, Zhang, & Chapman (2013) emphasized that properly used information from the internet adds value to education, providing a cost-effective alternative to traditional printed resources. UNESCO (2013) highlighted that internet use in education enhances information retrieval, individualized learning, group learning, & collaborative activities,

promoting a dynamic & interactive learning environment. Metzger & Flanagin (2013) found that perceived usefulness of the internet played a stronger role in usage compared to perceived ease of use, reinforcing the significance of internet utilization in education. The literature review further supports the notion that internet usage can positively influence academic performance. For example, Vigdor, Ladd, & Martinez (2014) found that students who use the internet moderately both at school & home tend to achieve higher grades, whereas light users (those using the internet only at school) obtained lower grades compared to non-users.

Conclusions

Students in Sheema District have positive perceptions regarding internet accessibility, as indicated by an overall mean score of 3.62. A significant majority of students reported favorable experiences with internet availability, data sufficiency, internet speed, affordability of data, and access to electricity at school. These findings highlight that most students have access to reliable internet resources, which positively contributes to their learning experiences.

A significant majority of participants recognized the benefits of ICT in fostering creativity, supporting knowledge acquisition, promoting effective communication, enhancing engagement, and improving overall teaching and learning effectiveness. These positive perceptions underscore the potential of ICT as a valuable tool for enhancing various educational aspects and contribute to the higher overall mean score.

There was a statistically significant correlation between internet accessibility and ICT use in teaching and learning in secondary schools, reinforcing the reliability of the relationship. The positive correlation ($r = 0.60^{**}$) suggests that as internet accessibility improves, there is a corresponding improvement in the teaching and learning process in the secondary schools studied.

Recommendations

The study findings found the positive perceptions of students regarding internet accessibility and the use of ICT in teaching and learning. Therefore, the government should invest in improving internet connectivity, data availability, and digital resources to foster a conducive learning environment for students.

The study's findings highlighted the potential of ICT in improving various aspects of the educational process. Therefore educationists and stakeholders should actively promote the integration of ICT in teaching methodologies to foster creativity, knowledge acquisition, communication, and engagement among students.

The statistically significant correlation between internet accessibility and ICT use in teaching and learning underscores the importance of policy decisions aimed at bridging the digital divide and promoting digital inclusion in education. Therefore, policy makers should prioritize initiatives that address challenges faced by minority students in terms of internet access, data affordability, and electricity availability at schools.

Areas for further research

- The long-term effects of ICT integration on students' academic performance, retention rates, and overall educational outcomes.
- The factors that hinder internet accessibility for the minority of students is essential.
- The impact of teacher training and professional development programs on educators' proficiency in integrating ICT effectively into their teaching methodologies.
- Students' digital learning engagement and the factors influencing their active participation in use of ICT in classes can be valuable.

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Appendices

Appendix I: Questionnaire for Teachers

Introduction

I am Barekye Barisigara, a student of Bishop Stuart University. I am carrying out a research study entitled “Internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District”. The study is for academic purposes in the pursuit of the award of Master of Education in Administration and Planning. The data collected will be basically used for academic purposes and will be treated with utmost confidentiality. The researcher will be grateful if you could spare a few minutes to complete this questionnaire.

Instructions: You are required to tick in boxes provided.

Section A: Background information

1. Age of respondent

.....

2. Sex of respondent

(a) Male ☐

(b) Female ☐

3. Highest level of education

(a) Diploma ☐

☐ (b) Degree ☐

(c) Others specify

Section B: The extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District

1. How do you relate the following levels concerning the extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District?

SD = Strongly Disagree, D = Disagree, NS = Not sure, A = Agree, SA = Strongly Agree

No.	Items	SD	D	NS	A	SA
1	The network for internet is always available					
2	There is enough data for internet					
3	The speed of internet is fast during surfing					
4	I afford the costs of data					
5	There availability of electricity at school					

Section B: The level of ICT use in teaching and learning in Secondary schools of Sheema District

How do your relate the following levels of the level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools of Sheema District SD = Strongly Disagree, D = Disagree, NS = Not sure, A = Agree, SA = Strongly Agree

No.	Items	SD	D	NS	A	SA
1	ICT enables teachers and students' to be more creative and imaginative during teaching and learning					

2	The use of ICT helps teachers and students to find related knowledge and information for teaching and learning					
3	The use of ICT encourages teachers to communicate more with their learners					
4	The use of ICT increases teachers and students' confidence to participate actively in the class					
5	Students learn more effectively with the use of ICT and teachers teacher more effectively.					
6	The use of ICT helps to broaden student and teachers' knowledge paradigm.					
7	The use of ICT helps to improve student and teachers' ability specifically in teaching, reading, and writing					
8	The students' are more behaved and under control with the use of ICT when teachers are teaching.					
9	The use of ICT enables students' to express their ideas and thoughts better with their teachers.					
10	The use of ICT promotes active and engaging lesson for students and teachers' best teaching and learning experience.					

Thanks for your participation

Appendix 2: Questionnaire for Students

Introduction

I am Barekye Barisigara, a student of Bishop Stuart University. I am carrying out a research study entitled “Internet accessibility and ICT use in teaching and learning in government aided secondary schools of Sheema District”. The study is for academic purposes in the pursuit of the award of Master of Education in Administration and Planning. The data collected will be basically used for academic purposes and will be treated with utmost confidentiality. The researcher will be grateful if you could spare a few minutes to complete this questionnaire.

Instructions: You are required to tick in boxes provided.

Section A: Background information

1. Age of respondent

.....

2. Sex of respondent

(a) Male ☐

(b) Female ☐

3. Level of education

(a) S.1 ☐

(b) S.2 ☐

(c) S.3 ☐

(d) S.4 ☐

(e) S.5 ☐

(f) S.6 ☐

Section B: The extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District

5. How do you relate the following levels concerning the the extent of internet access and ICT use for teaching and learning in government aided secondary schools of Sheema District?

SD = Strongly Disagree, D = Disagree, NS = Not sure, A = Agree, SA = Strongly Agree

No.	Items	SD	D	NS	A	SA
1	The network for internet is always available					
2	There is enough data for internet					
3	The speed of internet is fast during surfing					
4	My parents afford the costs of data					
5	There availability of electricity at school					

Section B: The level of effectiveness in the use of ICT in teaching and learning in government aided secondary schools

6. How do you relate the following the levels of effectiveness in the use of ICT in teaching and learning in government aided secondary schools of Sheema District

SD = Strongly Disagree, D = Disagree, NS = Not sure, A = Agree, SA = Strongly Agree

No.	Items	SD	D	NS	A	SA
1	ICT enables students' to be more creative and imaginative during teaching and learning					
2	The use of ICT helps students to find related knowledge and information for teaching and learning					
3	The use of ICT encourages teachers to communicate more with their learners					
4	The use of ICT increases students' confidence to participate actively in the class					

5	Students learn more effectively with the use of ICT					
6	The use of ICT helps to broaden students' knowledge paradigm.					
7	The use of ICT helps to improve students' ability specifically in reading, writing					
8	The students' are more behaved and under control with the use of ICT.					
9	The use of ICT enables students' to express their ideas and thoughts better					
10	The use of ICT promotes active and engaging lesson for students' best teaching and learning experience.					

Thanks for your participation

Appendix 3: Interview Guide for Head Teachers

I am Barekye Barisigara, a student of Bishop Stuart University. I am carrying out a research study entitled “The Influence of Internet accessibility and ICT use in Teaching and Learning in Secondary Schools of Sheema District”. The study is for academic purposes in the pursuit of the award of Master of Education in Administration and Planning. The data collected will be basically used for academic purposes and will be treated with utmost confidentiality. The researcher will be grateful if you could spare a few minutes to complete this questionnaire. This information will be kept secret and your cooperation will be highly appreciated.

Questions

How do you comment on the following items concerning the influence of internet accessibility and ICT use in Teaching and Learning in Secondary schools of Sheema District

Internet accessibility

Network

.....

Internet speed

.....

Financial constraints (data)

.....

Electricity

.....

.....

The use of ICT in teaching and learning

Computers

.....

.....

Smart phones

.....

.....

ipads

.....

.....

Thank you

Appendix 4: Map of Uganda Showing Sheema District



Appendix 5: Map of Sheema District

