Adoption of Information and Communication Technologies and Use of Learner-Centered Pedagogies among Teachers in Secondary Schools in Namayingo District

Emmanuel Masanja

BU/GS18/EDM/02

A Dissertation Submitted to the Directorate of Graduate Studies, Research and Innovations in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Educational Leadership and Management of Busitema University

March, 2024

Declaration

I, Emmanuel Masanja (BU/GS18/EDM/02), hereby declare to the best of my knowledge that this piece of work is truly mine and has never been submitted for the award of degree in any other University or higher institute of learning for any Academic award.

Signature: ---------- Date: 11th March 2024

Emmanuel Masanja (BU/GS18/EDM/02),

Approval

This Dissertation titled "Teacher Adoption of ICT and their use of learner-Centered pedagogies in Secondary Schools in Namayingo District" has been written and submitted with our approval.

Supervisor

Signature..... Date..11/03/2024.....

Associate Professor David Kani Olema

Supervisor

Signature..... Date..11/03/2024.....

Mr. Leonard Wamakote

Dedication

I dedicate this work to my beloved parents; the late KamuMasanjaMudiba and Helen BuboluMasanjafor theirencouragement, financial, moral and spiritual support, which enabled me to complete this course. To my dear and beloved wife, Martha Anyango, for her wise counsel encouragement and endurance during the course of my studies and to my children; Hope, Charity, Noëline, Norman, Shanita, Stephen, Resty and Andrew, who dearly missed dad's love, when i was always away in pursuit of this academic milestone.May God bless you all.

Acknowledgements

I am indebted to the Almighty God who has given me the gift of life, knowledge and endurance to carry out my studies. I also appreciate all the individuals and institutions that played a significant role towards the success of this research by availing me their time and space. Special thanksgo to my supervisors, Professor David Kani Olema and Mr.Leonard Wamakote who were always there for me. Their tireless effort in guiding me to the completion of this report is highly appreciated.

My sincere gratitude goesto my lecturers;Associate Professor David Kani Olema, Associate ProfessorZami Dennis Atibuni,Dr. Muhamadi Kaweesi, Professor Edward Andama, Mr. LeonardeWamakote, Dr. CharlesEryenyu, and Dr.Margaret StellaUjeyofor their academic guidance during my courseof the study. I am grateful to Agnes Nabitulah who always encouraged me. Lastly, to my Master's Program 2018/2020 classmates who have walked with me to the end.

Table of Contents

List of tables

List of figures

List of Abbreviations and Acronyms

ARPANET:	Advanced Research Projects Agency Network
CBT:	Computer Based Training
DEO:	District Education Officer
DIS	District Inspector of Schools
IBT:	Internet Based Training
ICT:	Information and Communication Technology (ies)
LAN	Local Area Network
LCP	Learner Centered Pedagogy (ies)
LMS	Learning Management System
MOES:	Ministry of Education and Sports
MOESST:	Ministry of Education, Sports, Science and Technology
MOICT	Ministry of Information and communication Technology
NCDC:	National Curriculum Development Center
NEPAD:	New Partnership for Africa's Development
SPSS:	Statistical Package for Social Sciences
TAM:	Technology Acceptance Model
UCC:	Uganda Communications Commission

UNESCO:	United Nations Education Scientific and Cultural Organization
UTAUT:	Unified Theory for Acceptance and Use of a Technology

Abstract

This study investigated the relationship between the adoption of information and communication technologies and the use of learner-centeredpedagogies among teachers in Secondary Schools in Namayingo District. Specifically, the study evaluated the levels of ICT adoption and use of learner-centered pedagogies. It also examined the relationship between teachers' ICT adoption and their use of learner-centered pedagogies and analyzed the factors influencing teachers' ICT adoption and use of learner-centered pedagogies. The study utilized a cross-sectional survey design that incorporated both qualitative and quantitative data collection methods. The study involved eight head teachers, 123 instructors, and 346 pupils chosen by purposive sample, simple random sampling, and proportionate sampling procedures respectively. Students completed a close-ended questionnaire, teachers provided quantitative data through a standardized open-ended questionnaire, and head teachers participated in interviews. The study found that the teachers' adoption of ICT and the implementation of learner-centered pedagogies were typically low, as indicated by the majority of students' responses scoring between 2.0-2.29 and 1.2-2.1, respectively. The findings indicated a moderately positive correlation between the adoption of ICT and the utilization of learner-centered teaching methods ($r = .38$, $p < .001$), suggesting that ICT adoption supports the implementation of learner-centered pedagogies. If ICT adoption is completely accepted in secondary schools in Namayingo District, learner-centered pedagogies would improve, leading to enhanced student achievement. The study recommended that stakeholders should regularly provide comprehensive supervision for the implementation of ICT. Additionally, additional ICT devices and reliable power sources, such as electricity or alternatives, should be made available and expanded to schools. Furthermore, instructors should receive comprehensive training in ICT pedagogy.

Chapter One

Introduction

1.0 Introduction

The study aimed to investigate the relationship between Teacher Adoption ofICT and their use of learner-centered Pedagogies (LCP) in Secondary Schools in Namayingo District, Uganda. Teacher ICT Adoption is the independent variable while LCP is the dependent variable. The chapter highlighted the background of the study, problem statement, purpose, research objectives, research questions, hypotheses, significance, scope andconceptual framework.0

1.1 Background of the study

Education is a social endeavor where quality is typically linked to effective teachers who have close relationships with their students and are the primary source of information (Emaliana, 2017). This conventional approach is teacher-centered and mostly relies on lecturing, question-and-answer sessions, and rote learning. It is linked to a hierarchical teaching method that promotes passive learning and memorization, thereby impeding the advancement of higher-order cognitive skills in learners (Mongwaketse, 2018).

The introduction of Information and Communication Technology (ICT) has altered the way people live, work, and learn in the 21st century (Ukata and Onueka, 2020). In the education sector, there have been significant developments in digital applications in educational technology. This requires teachers to incorporate Information and Communication Technology (ICT) into their teaching methods to keep up with the fast-paced technological progress (Mathevula and Uwizeyimana, 2014). This suggests that conventional teaching approaches based around the teacher may not be suitable in the current digital age since they may not align with the requirements of modern learners. In Uganda, the Ministry of Education and Sports (MoES)

reviewed the lower secondary curriculum in 2019, focusing on learner-centered pedagogies and integrating ICT into teaching all subjects.

1.1.1 Historical Background

Technology has evolved since the Stone Age when early humans began using their intelligence to improve their way of life (Fischer, 2017). Technology has rapidly progressed from basic instruments to sophisticated advancements in computer technology, as shown by Shuhua and Quani (2015). Gutierrez (2018) asserts that ICT has progressed from the 1960s with the creation of a basic mouse to sophisticated technologies like smartphones, computers, laptops, the internet, and more in the 20th century. The phenomenon originated in Western countries and subsequently extended to Eastern countries and Africa (Garanga, 2019).

In Africa, Information and Communication Technology (ICT) gained significance in the late 1990s and saw a surge in the 2000s as many African nations embraced ICT research aimed at advancing development and societal transformation (Ponelis and Holmner, 2015). Since then, there have been other attempts to incorporate ICT into the curriculum of African schools, resulting in varying degrees of success. The New Partnership for Africa's Development (NEPAD) e-schools program aims to provide ICT to all schools in Africa (Mbithe et al. 2016).

The national ICT policy formulation process in Uganda began in 1998 under the Uganda National Council of Science and Technology (Torach, et al. 2006 as quoted in Hennessy, et al. 2010). Uganda adopted a national policy ICT framework, enabling the country to pursue the objective of lifelong education for all. This framework led to the introduction of a new curriculum policy reform which included the teaching of computer studies as a subsidiary subject at A’ level to impart computer skills to students in 2011. To enhance science teaching in Uganda, ICT was integrated into government secondary schools but only connected \schools to the

internet and installed virtual science content in ICT laboratories and several teachers retooled, (MoES 2020, UCC 2014).

1.1.2 Theoretical background

This study is based on the Technology Acceptance Model (TAM) developed by Davis (1989) due to its strong predictive capabilities for user acceptance of information technology. He believes that consumers' acceptance of technology is impacted by their opinions of its usefulness and ease of use in the context of work performance. Davis determined that an individual's observable usage of a specific system, such as technology, is primarily defined by the actual use of the system. An individual's behavior towards using technology is influenced by their perception of its usefulness and ease of use, which is also shaped by their attitude towards the technology. Davis (1989) argues that perceived usefulness refers to the extent to which an individual believes that utilizing a specific technology system would improve their job performance. External aspects such as system characteristics, development process, and training influence the perceived utility and perceived ease of use.

1.1.3 Conceptual Background

ICT is a set of interconnected technological tools utilized for gathering, processing, distributing, organizing, storing, and accessing information. ICT, as defined by Garanga (2019), encompasses a variety of technological techniques and resources utilized in the generation, distribution, and organization of information. Tools such as computers, photocopying machines, projectors, interactive whiteboards, Internet, digital cameras, television CD/DVD Players, radios, and tape recorders are utilized in teaching (Ochwo, et al., 2018).

ICT adoption in education involves gradually transitioning to automate various aspects of the educational process, including administrative tasks like student admission, registration, and

evaluation, as well as creating a personalized learning management system (Basri, et al., 2018). Nurjanah, et al. (2017) examined ICT adoption in education as the utilization and implementation of ICT in teaching, learning, and administration to enhance the attainment of educational objectives, priorities, and strategies. This study will define ICT adoption based on Basri et al.'s (2018) framework, which includes Infrastructure, Application, and Policy.

Learner-centered pedagogies (LCP), also known as student-centered learning pedagogy, is defined by Dolores and Ernest (2018) as an instructional method that prioritizes placing the student at the centre of the learning process. This teaching technique views the learner as an autonomous individual with distinct experiences and motivators, where the learner generates knowledge through their investigation. This research will examine learner-centered pedagogy, specifically focusing on Problem-based, Project-based, and Inquiry-based teaching.

In today's technological age, teachers have shifted from being seen as mere suppliers of information to becoming facilitators of student learning. Utilizing learner-centered ICT-supported pedagogies is crucial for developing the 21st-century skills necessary to prepare learners with the knowledge and attitudes required to succeed in today's knowledge economy (Patel & Patel, 2017). Some ICT initiatives do not effectively support instructors in implementing learner-centered pedagogies in classrooms due to technological, institutional, and personal limitations.

1.1.4 Contextual background

Amid the COVID-19 pandemic, limitations on social gatherings hindered classroom interactions, leading students and teachers to rely on ICT for continuous learning (UNESCO, 2020, Vizo, et al. 2020). The importance of ICT in education is increasing since it plays a crucial

role in developing the 21st-century skills required to provide students with the knowledge and attitudes necessary to succeed in today's information-based economy (MOES 2019).

In India, the concept of integrating ICT into education was first explored in the 1970s when educational organizations recognized its potential to enhance teaching and learning outcomes (Pandey and Pandey, 2020). The Government of India implemented centrally sponsored schemes such as Educational Technology and Computer Literacy in Schools to promote ICT adoption and integration. National-level ICT educational curricula for students and teachers were developed as well (Phutela and Dwivedi, 2019).

The Ghanaian government recognized the need of using ICT in the education sector. De-Graft (2018) emphasized the importance of providing ICT training and education in schools to enhance the education system. ICT integration and adoption in the teaching-learning process in Uganda are currently gaining momentum according to Ali et al. (2013). The national ICT policy formulation process began in 1998 under the Uganda National Council of Science and Technology, as referenced by Torach et al. (2006) in Hennessey et al. (2010). The council created a national policy ICT framework, enabling Uganda to adopt the objective of lifelong education for all (Farrell, 2007).

In 2011, the Ministry of Education and Sports, through NCDC, implemented a new curriculum policy reform that incorporated computer studies as a subsidiary subject at the A level to provide students with computer capabilities. The new curriculum had issues in many secondary schools, prompting the government, through the Ministry of ICT, to reassess the 2003 ICT policies in all sectors nationwide (MoICT, 2014, MoESST, 2016). ICT was deployed in 1027 government secondary schools in Uganda to improve science instruction. However, only 819 schools were connected to the Internet, and virtual science content was put in ICT

laboratories in just 634 schools (MoES, 2020, UCC, 2014).Yet, current ICT initiatives do not sufficiently focus on how teachers implement student-centered teaching methods in classrooms. The 2019 National Teacher Policy recognizes the significance of incorporating ICT in Uganda's education system, but primarily emphasizes establishing efficient ICT systems for managing teacher records and information to enhance planning and administration, rather than emphasizing the use of ICT in the teaching and learning process. In Namayingo District, the government has provided computers to schools and trained some teachers on ICT integration. However, there is a shortage of computers in relation to the number of students, a lack of ICT teachers, and a negative attitude among teachers towards using ICT for teaching, all of which are obstacles to the integration of ICT in education (Mongwaketse, 2018).

1.2 Problem statement

Enhancing the quality of student learning is the primary objective of the educational process and a shared aspiration of all nations. ICT adoption in education is increasingly focused on improving learner-centered pedagogies to enhance the quality of students' learning and create a more effective and efficient education system. Vibrant ICT adoption is crucial for implementing learner-centered pedagogies through full-scale automation of teaching and learning processes (MoICT, 2014).

Despite government and stakeholders' efforts to enhance ICT-based e-teaching pedagogies through investments, donations of ICT equipment, teacher training, and provision of virtual content to schools since 2014, there are still constraints in implementing ICT-driven learner-centered pedagogies as expected by the Ministry (MoESST, 2016; Landon et al., 2013). The number of teachers using traditional teaching approaches is a concern, as stated by De-Graft (2018). The teachers' inadequate adoption of ICT and their use of learner-centered pedagogies

have led to poor performance in active e-teaching, low education standards, and a shortage of competent ICT-skilled instructors (Mukhula et al, 2021; Mukelele, 2019; Newby et al, 2012). Failure by secondary school instructors in Namayingo district could hinder the learners and the district's progress in terms of socioeconomic development, impacting national and global competitiveness.

According to Mukhula et al. (2021), Mukelele (2019), Burns et al. (2019), and Buabeng-Andoh (2015), secondary school teachers fail to use ICT-based learner-centered pedagogies due to reasons such as limited access to ICT tools, lack of electrical power, limited internet, and lack of technical support. In Namayingo district's secondary schools, there is a gap in the teachers' adoption of ICT and their implementation of learner-centered pedagogies, which is evident in the education system. The gap may result in deficiencies in 21st-century skills, substandard education and service provision, and inadequate execution of Uganda's Vision 2040. This study aimed to examine the continued utilization of teacher-centered techniques notwithstanding ICT interventions by the government and other stakeholders.

1.3 Purpose of the Study

The purpose of this study was to find out whether ICT adoptionaids teachers in using learner-centered pedagogies in secondary schools in Namayingo District.

1.4 Objectives of the study

The study was guided by the following objectives

1. To assess the level of ICT adoption in secondary schools in Namayingo District.
2. To assess the extent of use of learner-centered pedagogies in secondary schools in Namayingo District.

3. To establish the relationship between ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District.
4. To examine the factors influencing ICT Adoption in secondary schools in Namayingo District.

1.5 Research Questions

The following questions helped to reflect on the research objectives:

1. To what extent has ICT been adopted in secondary schools in Namayingo District?
2. To what extent have learner-centered pedagogies been used in secondary schools in Namayingo District?
3. What factors influence ICT adoption in secondary schools in Namayingo District?

1.6 Hypotheses of the Study

To achieve objective four, the following hypotheses were tested:

Ho1**:** There is no significant relationship between Information and Communication Technology adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District.

1.7 Significance of the Study

The findings of the study of ICT adoption may lead to innovation towards more student-centered pedagogies in the teaching-learning process

The study may be used to provide various education stakeholders such as MoES, Head teachers, and teachers among others with information that may enable them to come up with clear policies while adopting ICT in schools.

The study may also provide additional information to the National Curriculum Development Center (NCDC) on ICT adoption in teaching and learning processes.

The research findings will add to the growing body of knowledge regarding ICT adoption in Education.

The information from the study may also help school administrators create supportive ICT environments in schools to enhance ICT implementation and adoption.

1.8 Scope of the Study

1.8.1 Geographical Scope

The study was carried out in Namayingo district in eastern Uganda. The District has six government schools and seven private secondary schools. The study was carried out in five government-aided secondary schools and 3 private schools. The study was carried out in Namayingo because it is a rural district where ICT is being adopted by various schools.

1.8.2 Content Scope.

The study explored the effect of ICT adoption on the teaching and learning pedagogies used in secondary schools and concentrated on assessing the level of ICT adoption in secondary schools, assessing the extent of the use of learner-centered pedagogies in secondary schools, examining the factors that influence ICT adoption the use of learner-centered pedagogies and establishing the relationship between ICT adoption and the use of learner-centered pedagogies used in secondary schools in secondary schools in Namayingo District.

1.8.3 Time Scope

The study was conducted between March 2022 and June 2022. The study looked at eight years, that is from 2014 to 2022. The period is chosen because it's when the government was urging schools to adopt and introduce ICT by supplying ICT tools to most government secondary schools.

1.9 Conceptual Framework

Below is a conceptual framework showing the relationship between the independent and dependent variables. The Independent variable is ICT Adoption while the dependent variable is learner Centered Pedagogies.

Independent Variable **Dependent Variable**

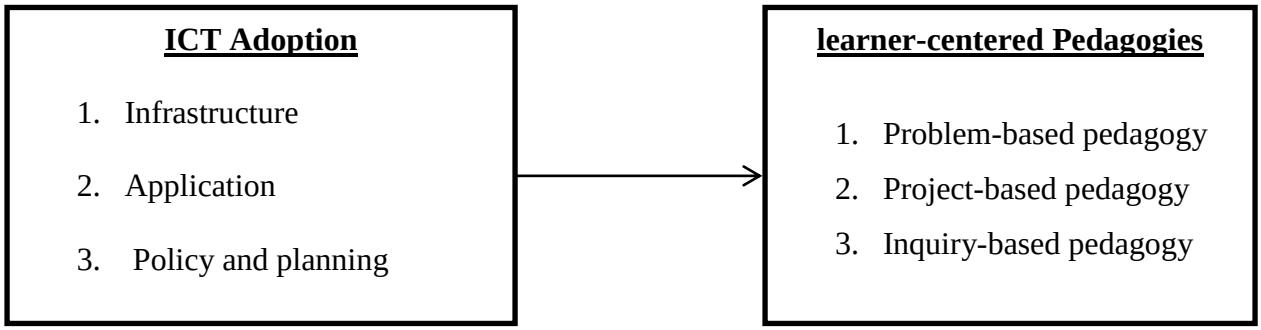


Figure 1: Conceptual Framework

Source: Adopted from Lawrence and Tar (2019) and modified by the researcher.

Figure 1 above explains theconceptual framework which shows the relationship between the independent variable, (ICT Adoption) and the dependent variable, (learner-centered pedagogies). The Independent variable comprises Infrastructure, Application, and policy. Infrastructure includes ICT tools (computers, projectors, among others), laboratory/ store, internet connection and access, and power sources to run the tools. Application includes learning content systems and search engines where students can access the information through various ICT dimensions such as web-based, computer-assisted, E-learning and virtual learning. The policy entails the national and educational ICT frameworks that regulate ICT implementation and use in schools.

The dependent variable comprises Problem-Based Instruction, Project-based pedagogy and Inquiry-based pedagogy. The framework suggests that if schools have ICT tools, the internet, power, a learning-content system linked to the curriculum and appropriate government and

school ICT policies, then teachers are most likely to use learner-centered approaches that allow learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem. This depends on teachers' and learners' perception that when ICT is useful and easy to use, then they will be willing to integrate it into the teaching-learning process.

While this is true, ICT adoption may not be the only motivator for teachers' use of leaner-centered pedagogies. Other factors (Extraneous Variables) such as teachers' and students' ICT skills and attitude, finance and the willingness of the school administration may affect teachers' use of learner-centered pedagogies

Chapter Two

Literature Review

2. 0Introduction

The literature reviewed in thischapter relates to ICT adoption and the use of learner-centered pedagogies in secondary schools, especially as related to the context ofNamayingo District. The literature review, which includes conceptual and theoretical reviews on ICT adoption and the use of learner-centered pedagogies was based on the study objectives; assessing the level of ICT adoption in secondary schools,assessing the use of learner-centered pedagogies in secondary schools, establishing the relationship between ICT adoption and the use, and examining the factors influencing ICT adoption in secondary schools used in secondary schools, as applicable to NamayingoDistrict in Eastern Uganda. The review of literature also spotlights related studies carried out on ICT adoption and the use of learner-centered pedagogies in secondary schools and the related gaps found in the literature.

2.1. Theoretical Review

This study is grounded within the Technology Acceptance Model (TAM) designed by Davis (1989). This theory assumes that when users perceive that a type of technology is useful and easy to use, they will be able to use it. The basic TAM model tested two specific beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). However, according to Ghavifekr, et al (2016), Luhamya et al. (2017) and Gellerstedt, et al. (2018,), this perceived usefulness and perceived ease of use are influenced by external variables such as system characteristics, development process, and training. Ajibade (2018) further states that this model is based on the theory of reasoned action which states that social behavior is motivated by an individual attitude which is designed to predict information system use.

TAM has been criticized for putting too much emphasis on technology leaving other factors such as the social context, culture and cognitive instrumental processes (Ghavifekr, et al 2016) which influences one to accept a technology. Seng et al. (2016) also say that TAM omitted the subject norm because the variable is unable to explain behavioural intention. Based on the above criticisms, Venkatesh and Davis (2000) reviewed TAM and came up with TAM 2 after finding out that both perceived usefulness and perceived ease of use were found to have a direct influence on behaviour intention. This study could also be supported by the unified theory for acceptance and use of a technology (UTAUT) advanced by Venkatesh, et al. (2000) because it includes social influence. In this study, TAM is adopted because it is a robust and powerful model for predicting user acceptance of information technologies in spite and it fits in the context gradually as the users get used to it. This explains why it has been used in many empirical studies and proven to be of quality and statistically reliable (Luhamya et al.2017, Olushola and Abiola 2017).

2.2 Conceptual Review

2.2.1 Teacher Adoption of ICT

ICT adoption in education involves gradually transitioning to automate various aspects of the educational process, including administrative tasks like student admission, registration, and evaluation, as well as creating a tailored learning management system (Basri, et al., 2018). In addition, Nurjanah, et al. (2017) examine the adoption of ICT in education as the utilization and implementation of ICT in teaching, learning, and administration to enhance the attainment of educational objectives, priorities, and strategies.

ICT utilization in education is in its early stages in most sub-Saharan African countries. New advancements and announcements regarding ICT in education are consistently being made

across the continent, as evidenced by Mukhula (2021) and Mbithe et al. (2016). Setting up ICT labs provides the potential for a self-directed learning setting where each child has access to one device, overseen and guided by a proficient and informed instructor. Nurjanah and colleagues (2017) argue that ICT laboratories should be equipped with electricity, TV/Radio, communications devices, computers, internet access, sufficient bandwidth, printers, scanners, fax machines, and smart devices.

Educational technologists now argue that computer labs are outdated and hinder education by creating a gap between computing and the general curriculum. Some suggest that having fewer computers and devices in classrooms can better integrate ICT with the curriculum (Pedro, 2012). Access to ICT infrastructure and resources in schools is essential for integrating ICTs into education. ICT adoption and integration rely primarily on the accessibility and availability of ICT resources, including hardware and software (Chavez et al., 2020). Without access to ICT resources, teachers will not utilize them, resulting in students having limited exposure to ICT opportunities.

An effective strategy and policy are necessary for the successful integration of ICT in secondary schools. Prioritizing comprehensive pedagogical training for teachers to effectively utilize ICT in supporting learner-centered teaching approaches is crucial. UNESCO (2019) states that effectively incorporating ICT into the curriculum is essential for the implementation of ICT. Burns, et al. (2019) note that the implementation of ICT in the education sector across several African countries is progressing at varying speeds but is hindered by inadequate policies and infrastructure. MOES (2019) and Hennessy et al. (2010) share the same perspective. They believe that among the strategies in East African ICT policies, those related to curriculum,

teacher training in ICT skills and pedagogical use of ICT are crucial for the integration of ICT in secondary schools.

Adopting ICT in schools necessitates networking the entire institution to provide teachers and students with access to multimedia and educational resources through the school's Intranet and the Internet. This requires the implementation of many ICT aspects like web-based, computer-assisted, E-learning, and virtual learning. Phutela and Dwivedi (2019) and Nurjanah et al. (2017) argue that schools should own email, websites, and software integrated with the curriculum and search engines to allow teachers and students to access material for educational reasons. Okuonzi et al. (2021) emphasize the need to have Learning Management Systems aligned with the institution's learning and teaching strategy, integrated with the major Integrated Management System, and designed to be accessible, adaptable, flexible, and sustainable.

Policy and planning play a crucial role in ICT integration in schools as they help establish the objectives of using ICT in education and prioritize resource allocation for its implementation. Ali et al. (2013) suggest that governments should establish policies regarding ICT literacy for teachers and administration, as well as an institutional ICT strategy and plan. These policies should acknowledge the strategic importance of ICT for growth, development, and pedagogical purposes. UNESCO (2019) suggests that ICT planners should take into account the overall cost-benefit analysis, provision and upkeep of necessary infrastructure, and ensure that expenditures align with teacher support and other policies aimed at promoting successful ICT utilization. Okuonzi et al. (2021) state that institutions' strategic and operational plans should acknowledge and promote the use of technologies to enhance learning and teaching. Specific plans for e-learning should be in line with the education sector's strategic and operational plans, particularly regarding budgetary and financial allocation provided by the education sector.

MoES (2020) states that although national policies and strategies acknowledge the importance of developing ICT skills in education, there is currently no national ICT Education Framework that specifies the competencies, skills, knowledge, and proficiencies needed at various levels of the education sector or by workers and citizens. The absence of an ICT policy in Uganda's education sector may be impeding the ongoing and consistent investments in ICT infrastructure and connectivity by the Ministry of Education and its partners.

2.2.2 Learner-Centered Pedagogies (LCP)

This is also called student-centered learning pedagogy and is defined by Dolores and Ernest (2018) as a system of instruction which places the student in the heart of learning and the teacher as a facilitator during the teaching-learning process. This is in line with Darsih's (2018) definition which opines that it is a pedagogy which emphasizes the use of different methodologies that shift the role of teachers from givers of information to facilitators in student learning. Emaliana (2017) looks at learner-centered pedagogy as a methodology which gives students opportunities to improve their analytical skills and problem-solving skills, as well as skills in deep learning, lifelong learning, and self-directed learning. Additionally, Mongwaketse (2018) defines learner-centered Pedagogy as a teaching approach based on the constructivist principle of learning where the learning process becomes more of a shared activity with knowledge being constructed by both the teacher and the learners rather than transmitted directly by the teacher. Therefore, learner-centered Pedagogy is a methodology where learners are enhanced to create knowledge rather than just passively take on information or facts from the teachers. There are many learner-centered pedagogies but this study will focus on problem-based problem-based, project and inquiry-based instructions because they are closely interrelated (Sealfon 2012).

Problem-Based Instruction is an approach which empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Sealfon 2012, Savery 2006). In this methodology, students work in groups to solve complex, multi-faced, and realistic problems and learners acquire knowledge by formulating a solution to a real-world problem. Gonçalves and Capuch (2020) state that the use of ICT aids learners in the presentation of the course-related problem, practice, experiment and research, discuss, and talk about how they perceive the concept.

Project-based instruction is a multi-disciplinary approach which brings real-world problems together with knowledge and skills to enhance learning. Students are given open-ended tasks with more than one approach or answer, intended to simulate their self-learning. ICT project-aided methodology enhances learners' critical thinking and creativity skills and abilities (Santhi, et al. 2019). As a pedagogy which emphasizes the use of classroom projects intended to bring about active learning, students use technology and inquiry to engage with issues and questions that are relevant to their lives. This depends on technological resources, judging the suitability of using technology for the project and making efficient use of the internet by being encouraged to make informed choices in exploring relevant websites and developing critical thinking skills.

Inquiry learning is based on constructivist learning theory. In inquiry-based learning, learners are guided to generate relevant questions and to come up with the appropriate answers through critical thinking. In this pedagogy, students focus on how they learned in addition to what they learned, to activate metacognition skills. Hrast and Savec (2018) opine that in Inquiry-Based Learning, the use of ICT plays a vital role in searching, capturing, analyzing and presenting data. This is because according to Siddiquah and Salim (2017), ICT offers multiple

and enriched learning materials found on the Internet hence offering excellent and plenty of opportunities for students to have self-paced learning. However, to enhance best inquiry learning, teachers should allow students to make choices and decisions in classroom investigations as more students' thinking takes place when they are given an open opportunity. Generally, if properly adopted and integrated into the teaching-learning process, ICT can facilitate a shift in students' learning approach from reproducing knowledge conveyed by teachers to constructing knowledge themselves with teachers acting as facilitators or coaches. According to Omwenga (2006), ICT should enable learners to have the ability to access, use and evaluate information from different sources to enhance learning, solve problems and generate new knowledge.

2.3 Empirical Review of the Objectives

2.3.1 Teacher Adoption of ICT

Mukhula et al. Al (2021) notes that the implementation of ICT in African education systems is progressing at varying speeds, hindered by inadequate regulations, essential infrastructure like energy and devices, access to the Internet, financial resources, and teacher training. Burns et al. (2019) observed that many educational institutions in Africa encounter obstacles when trying to incorporate ICT into the teaching and learning process due to inadequate infrastructure, such as substandard laboratory conditions and limited access to ICT resources for students. Dele-Ajayi et al. (2021) noted that infrastructure failures often result from inadequate maintenance and improper use.

To successfully implement and incorporate ICT in schools, it is essential to establish a comprehensive networking system inside the entire institution. This will guarantee access to multimedia and educational materials through the school's Intranet and the Internet, regardless of the location of students and teachers, whether within or outside the school premises. Schools

should implement Learning Management Systems (LMS) and search engines to provide teachers and students with access to material, allowing them to deliver it individually or collaboratively using different ICT methods such as web-based, computer-assisted, E-learning, and virtual learning. UNESCO (2019) states that effective utilization of ICT necessitates incorporating and applying ICT throughout the curriculum development to provide well-prepared and informed ICT educators. Okuonzi et al. (2021) stated that LMS services must include high accessibility, scalability, flexibility, and sustainability to be effectively utilized by teachers and learners. This aligns with the research conducted by Phutela and Dwivedi (2019) and Nurjanah et al. Al (2017) suggests that schools should utilize email, websites, and software connected to the curriculum and search engines for educational purposes. However, UNESCO (2019) notes that using online content for interactive learning can be limited by the lack of control over school Internet connectivity, which is influenced by the national telecommunications infrastructure and access to reliable power supply.

A clear strategy or policy prioritizing comprehensive pedagogical training for teachers to successfully utilize ICT in supporting learner-centered pedagogies is crucial due to the rapid advancements and announcements in ICT in education across Africa. Policy and planning are crucial for defining the goals of utilizing ICT in education and setting priorities for resource allocation (Ali et al., 2013). According to MOES (2019) and Hennessy et al. (2010), East African ICT policies have many strategies, but there is a lack of emphasis on curriculum and teacher training in ICT skills and pedagogical use of ICT in secondary schools. Burns et al. (2019) state that plans and policies are influenced by reasons related to social and economic development, as well as digital inclusion, which are frequently connected to national vision policies. The Ugandan ICT strategy aims to transition Uganda from an agricultural society to a modern and affluent

nation by empowering Ugandans to live healthier, longer, and more innovative lives, aligning with the goals of Vision 2040 (UCC, 2014).

Although national ICT policies in Uganda acknowledge the importance of developing ICT skills in education, there is currently no national ICT Education Framework that specifies the competencies, skills, knowledge, and proficiencies needed at various levels of the education sector or by workers and citizens (MoES 2020). The absence of an ICT policy in Uganda's education sector may be impeding ongoing and consistent investments in ICT infrastructure and connectivity by the Ministry of Education and its partners.

2.3.2 The use of learner-centered pedagogies in secondary schools.

Dolores and Ernest (2018) define learner-centered pedagogy (LCP) as an instructional approach that prioritizes the student's role in learning, with the instructor serving as a facilitator. This aligns with Darsih's (2018) description, which states that it is a pedagogical approach that focuses on utilizing various approaches to transition teachers from information providers to facilitators of student learning. Emaliana (2017) examines learner-centered pedagogy as a strategy that provides students with chances to enhance their analytical capabilities, problem-solving abilities, and skills in deep learning, lifelong learning, and self-directed learning. Mongwaketse (2018) contends that learner-centered Pedagogy is an instructional method rooted in constructivist learning principles. It involves a collaborative knowledge-building process between the teacher and students, rather than a one-way transmission of knowledge from teacher to students. It is a system that encourages learners to actively generate knowledge instead of simply receiving information or facts from professors. This study will define learner-centered pedagogies as problem-based, project-based, and inquiry-based instructions.

Problem-based instruction is a method that enables learners to investigate, combine theory and practice, and utilize knowledge and abilities to provide a practical solution to a specific problem (Savery 2006). Students collaborate in groups to tackle intricate, multifaceted, and authentic problems, fostering effective collaboration and intrinsic motivation for learning. Noordin et al. (2011) noted that Problem-Based education commences with a problem that serves as the central focus of the learning process, guiding all student progress, planning, and work towards addressing the problem. According to Gonçalves and Capuch (2020), this teaching method involves using e-learning to help learners' practice, experiment, study, discuss, and articulate their understanding of concepts in their daily lives. This allows learners to develop confidence in problem-solving, critical thinking, motivation, and self-regulated learning skills, which are crucial in the contemporary labour markets of the 21st century (Patel and Patel, 2017). Dele Ajayi et al. (2021) affirmed that the primary value of ICTs is their student-centeredstudent-centered approach, which promotes active student engagement in learning activities. However, according to An and Mindrila (2020) and Roy et al. (2014), implementing ICT-supported learner-centered education in the current education system is challenging due to its focus on rote learning and academic outcomes, as well as the lack of adequate ICT tools, power, and teachers' ICT skills.

Project-based instruction is a multi-disciplinary method that combines real-world challenges with knowledge and skills to improve learning. Students are assigned assignments with several approaches to encourage self-learning and foster cooperation abilities through social learning, ultimately enhancing creativity, a vital competency for success in the 21st century. According to Mirascieva (2021), project-based pedagogy is a structured educational approach that involves students in acquiring knowledge and skills through a sequence of intricate tasks like

design, planning, problem-solving, decision-making, creating products and artefacts, and communicating outcomes. Santhi, et al (2019) examines project-based pedagogy as a learning approach that involves learners being guided to acquire knowledge through project work. Jin, et al. (2020) stated that ICT can be a crucial element in fostering creative endeavours. According to Santhi, et al. (2019), utilizing ICT project-based methodology improves learners' critical thinking and creativity skills by providing challenges and motivation. Noordin, et al. (2011) suggest that students will enhance their teamwork skills, verbal communication skills, and writing skills. ICT can facilitate profound student learning by enabling access to real-world data and remote collaboration. This relies on technological resources, including assessing the appropriateness of technology for the project and utilizing the internet effectively, which may not be easily accessible in secondary schools in remote areas like Namayingo.

Inquiry learning is rooted in constructivist learning philosophy. Inquiry-based learning involves guiding learners to formulate pertinent questions and develop suitable solutions using critical thinking. In this teaching method, students are motivated to seek out and investigate new ideas and concepts through their discoveries, excursions, and interactions with objects and individuals. Hrast and Savec (2018) assert that the utilization of ICT in Inquiry-based learning is crucial for seeking, recording, analyzing, and presenting data. Siddiquah and Salim (2017) state that ICT provides abundant and enhanced learning resources available on the Internet, allowing students numerous opportunities for self-paced learning. This enables learners to independently construct knowledge, with teachers serving as facilitators or coaches. For this to work, ICT resources must be readily available to teachers and students in rural secondary schools where the use of ICT in education is not yet widespread.

Teachers must possess profound pedagogical expertise to effectively include and utilize ICT in their teaching (Zain 2013). Shimasaki (2015) attributes teachers' failure to utilize ICT for promoting Learner-Centered Pedagogies to the insufficient support and professional development provided to teaching practitioners before and during the implementation of ICT projects. ICT does not inherently result in teachers adopting learner-centered pedagogies, but it does facilitate innovative methods of teaching and learning, essentially improving the way teachers and students engage in familiar activities.

2.3.3 Teachers' Adoption of ICT and the use of learner-centered pedagogies.

This study aimed to examine how the use of Information and Communication Technology (ICT) in the classroom affects teaching and learning methods. It seeks to determine the educational impact that ICT can have on teaching and learning in schools. Effectively integrating ICTs into teaching and learning can lead to significant changes in educational content and teaching methods, which are central to modern education reform.

Many countries now consider comprehending ICT and mastering basic skills and concepts in ICT as essential components of education, on par with reading, writing, and numeracy (Srivastava, 2016). Gnanam, et al. (2016) suggest that when teachers effectively design and implement ICT-supported education in the classroom, it can enhance students' ability to acquire knowledge and skills necessary for self-directed and continuous learning.

Integrating and using ICT leads to the implementation of new teaching and learning methods. Gnanam, et al. (2016) noted that these approaches are based on constructivist learning theories and represent a transition from a teacher-centered pedagogy focused on memorization and rote learning to a learner-centered approach. Kennah (2016) states that ICT transforms the teacher's function from instructor to guide, simplifying the job. He also states that ICT enables

certain teachers to engage in collaborative and project-based education. Saxena (2017) asserts that effective utilization of ICT enhances both teaching and learning outcomes while also influencing job prospects.

ICT applications in the classroom can enhance teachers' pedagogy and alter their teaching methods. ICT facilitates closer interaction between teachers and students (Kennah, 2016). The teacher allows pupils to take on most of the work while acting as a coach who watches their progress. In 2016, proponents argued that incorporating ICT tools in education shifts the role of a teacher from being the primary authority figure to acting as a facilitator, mentor, and coach, transitioning from a "sage on stage" to a "guide on the side." The main responsibility of the teacher is to instruct pupils in asking questions, presenting difficulties, creating hypotheses, and finding information, among other tasks. Khokhar and Javaid (2016) state that students' study practices are shaped by their past study experiences, as the study found no connection between students' use of ICT and their expectations regarding teaching methods. Therefore, the process of adopting ICT should start by analyzing the characteristics and needs of learners in connection to the subject being taught. (Gnanam, et al., 2016).

To effectively incorporate and implement ICT in education, there needs to be a shift in emphasis from basic computer skills for teachers to comprehending ICT integration in education from a pedagogical standpoint, starting from teacher training institutions (Adam, et al. 2012, Ghavifekr, et al 2016). This will provide instructors with the essential pedagogical skills for integrating ICT in the classroom. Rastogi and Malhotra's (2013) study found a significant correlation between teachers' ICT skills, their attitude towards ICT, and the implementation of ICT in their teaching.

Utilizing modern ICTs in teaching allows for constructivist learning, enhancing course engagement through multimedia and facilitating easy comprehension for students. According to Khokhar and Javaid (2016), several teachers perceived that utilizing ICT has positively influenced students and their learning by aiding in personalized learning and enhancing the connection between classroom and extracurricular learning.

Utilizing ICT in the classroom can improve instructors' abilities to create pedagogical environments with ICT. This is dependent on instructors' attitudes regarding how easy they feel it is to use the ICT tools. Rastogi and Malhorta's (2013) study demonstrates a significant positive correlation between teachers' ICT skills, their attitude towards ICT, and the practical use of ICT in their classroom instruction. However, this requires the implementation of ICT technologies in teaching, which can be challenging. Srivastava (2016) explains that ICT integration and acceptance occur in three distinct areas: curriculum, subject, and lesson.

2.3.4 Factors influencing Teacher adoption of ICT in secondary schools

According to Buza and Mula (2017), there is no singular predominant element that influences ICT adoption. The progress of ICT adoption depends on many variables present in varied degrees in each school, making diverse elements potential limiting factors. The initial factor is the teacher's proficiency and abilities in using technology (Saxena, 2017). According to Buabeng-Andoh (2019), teachers must possess advanced competencies and a knowledgeable understanding of ICT to effectively choose the most suitable resources. Hu (2017) suggests that enhancing teachers' professional skills and competencies through ongoing ICT professional development is crucial for promoting meaningful ICT integration in classroom practices. (Ghavifekr, et al 2016) emphasizes that teachers must know how to integrate ICT into their teaching and may have to create new teaching methods to do so. Teachers' utilization of ICT in

lessons is influenced by their understanding of the subject matter and its connection to ICT. Basir et al. (2018) noted that the majority of instructors in sub-Saharan Africa lack ongoing professional development or support in ICT subjects or pedagogy.

Buabeng-Andoh (2015) identified three interconnected elements that affect the use of ICT in education: human, institutional, and technological. Personal variables encompass a teacher's perspectives, attitudes, and skills in utilizing ICT in the classroom. These elements are influenced by the teacher's educational background, age, gender, teaching experience, and students' engagement with ICT. Institutional elements encompass infrastructural and environmental preparedness in terms of power structures and management. Lawrence and Tar (2019) focus on institutional factors related to leadership support and resources. Technological elements encompass hardware and software ICT tools, which are system characteristics. Lawrence and Tar (2019) thoroughly examine technological issues such as compatibility, ICT benefits, perceived utility, and perceived ease of use. An, and Mindrila (2020) found that the primary obstacles to implementing technology for learner-centered pedagogy are limited time, inadequate technology, and insufficient understanding of learner-centered education have demonstrated that instructors' emotions, expertise, and beliefs impact how they incorporate ICT in their teaching (Buabeng-Andoh, 2015; Ghavifekr et al., 2016; Hu, 2017).

Teachers who have a favourable attitude towards educational technology can offer valuable insights on how to incorporate ICT into teaching and learning. Ali, et al. (2013) and Rastogi and Malhotra (2013) emphasize that the successful integration of educational technology into teaching methods relies heavily on teachers' support and attitudes. Similarly, Khokhar's (2016) study indicates that teachers' attitudes towards ICT and their perceptions of its effectiveness are crucial factors in their utilization of ICT in classroom instruction and

assessment. Teacher's views towards ICT impact their acceptance of technology's usefulness and their decision to adopt and use ICT in their classrooms (Ghavifekr, et al 2016).

School leadership significantly influences teachers' utilization of ICT in their teaching practices. Jakhar's (2015) study demonstrates that school leaders are responsible for executing technology plans and aligning their vision with instructors to encourage the integration of technology in their teaching. Thus, teachers' successful use of ICT relies on robust school leadership that implements well-crafted technological strategies in schools. Lawrence and Tar (2018) state that the main obstacle to integrating ICT into education is insufficient administrative assistance.

2.3.5 Literature Gaps

Reviewed studies have not exemplified the impact of ICT adoption on the use of learner-centered pedagogies by teachers in rural secondary schools with poor connectivity in Namayingo District. Many studies have explored the connection between ICT uptake and the implementation of learner-centered pedagogies, as seen in the review of related literature. However, they have not determined the influence or scope of ICT usage on instructors' utilization of learner-centered approaches.

Empirical studies on ICT adoption and teachers' use of learner-centered pedagogies have been extensively documented in various regions such as the USA, California, South Africa, Ghana, and Kenya, among others (Dele-Ajayi 2021, Pandey and Pandey 2020, Buabeng-Andoh 2019, and Mbithe et al 2016). Literature is scarce in Uganda regarding how ICT adoption techniques can improve learner-centered pedagogies (MoES 2020).

Research on ICT adoption and learner-centered approaches has primarily focused on urban and semi-urban secondary schools, neglecting rural schools like those in

NamayingoDistrict, which are predominantly rural. Most research on the adoption of ICT and learner-centered approaches is conducted in post-secondary institutions, particularly in developing countries that struggle to fund ICT initiatives in secondary education. This study aims to address this gap.

Chapter Three

Methodology

3.0Introduction

This chapter presented the procedure of how the research was carried out. It includes the research design, population of the study, sample selection and sample size, validity and reliability, data collection tools, procedures of data collection and data analysis, ethical considerations and limitations of the study.

3.1 Research Design

This study adopted a cross-sectional survey design, employing both quantitative and qualitative methods of data collection. This design provided greater depth and understanding of the topic and analysis of data from the study population at a specific point and same time. The quantitative method was used to collect data from teachers and students, to give a general picture of the level of ICT Adoption and the use of learner-centred pedagogies, and factors influencing ICT adoption in secondary schools in Namayingo District. The qualitative method was used to collect data from head teachers using interview questions to reveal the participants' understanding and interpretation of ICT Adoption and the use of learner-centred pedagogies in secondary schools in Namayingo District.

The qualitative approach was used because it gives details of the situation at hand and therefore the beneficiaries of the research findings are made to fully understand the situation at hand, why it is like that, and the practical solutions. Both qualitative and quantitative techniques of research were used for data analysis, presentation, and interpretation of the findings**.** The Pearson correlation coefficient was then applied to establish if there was a significant relationship

between ICT Adoption and the use of learner-centred pedagogies in secondary schools in Namayingo District. Finally, data from the teachers' open-ended questionnaire on extraneous variables was collected, analyzed and triangulated.

3.2 Study Population

The population of interest in this research consisted of eight head teachers 198 teachers and 3950 students in eight secondary schools in Namayingo District making a total of 4156 participants. These eight schools were selected because they had some ICT infrastructure among all the schools in Namayingo District. According to the data obtained from the Annual School Statistical Census Data Forms 2020 from Namayingo District Inspector of Schools, there are seven Government and five private secondary schools. However, the study was carried out in only eight schools because the rest do not have a single ICT gadget. The population of the study was 4156 respondents as summarized in Table 3.1 below.

Table 3.1: Participants Population Size

S/N	School	Head teacher	Teachers	Students
1	A	01	31	822
2	B	01	22	550
3	C	01	36	806
4	D	01	22	410
5	E	01	28	490
6	F	01	30	539
7	G	01	14	113
8	H	01	15	220
	Total	**08**	**198**	**3950**

Source: Annual School Statistical Census Data Forms 2020 (Namayingo District).

3.4 Sample Size

The sample size for the study was determined using the Krejcie and Morgan table (1970) and a sample of 346 participants was selected from a population of students to give quantitative data through closed-ended questionnaires,while 123 teachers were sampled to give quantitative data using open-ended questionnaires. Eight Head teachers from eight secondary schools gave qualitative data through interviews. Table 2 Illustrates students' proportionate sample size according to schools while Table 3.2 illustrates the sampling strategies used and the research instruments.

Table 3.2: Students proportionate sample size according to schools

S/N	School	Students	Proportionate No's
1	A	822	72
2	B	550	48
3	C	806	71
4	D	410	36
5	E	490	43
6	F	539	47
7	G	113	10
8	H	220	19
	Total	**3950**	**346**

Table 3.3: Participants Sample Size, Sampling Techniques andResearch Instruments

S N	Category	Population	Sample Size	Sampling Techniques	Research Instruments
1	Administrators	08	08	Purposive	Interviews
2	Teachers	198	123	Random sampling	Questionnaires
3	Students	3950	346	Proportionate sampling	Questionnaires

Source: DIS office for the study population, Morgan and Krejcie for sample size, and researcher for sampling techniques

3.5 Sampling Techniques

3.5.1 Purposive Sampling

The purposive sampling method was used to select head teachers based on their administrative positionswho are responsible for the day-to-day activities of the school and are accountable for all the decisions within the school. This sampling strategy was used because it enabled the researcher to get a lot of information from administrators as he was able to interact with the rightful people who know of ICT Adoption and teachers' use of learner-centered pedagogies.It was presumed that the selected administrators had key information.

3.5.2 Proportionate Simple Random Sampling.

This was used to select students according to their proportionate number in school. This technique was selected to ensure that the results obtained are fairly representative of what would have been obtained if the entire population had been measured (Shadish et al., 2002). The proportionate simple random sample allows all the units in the population to have an equal chance of being selected and their selection entirely depended on luck or probability of finding them at school.

3.5.3 Simple random sampling

Thiswas used to select teachers and to ensure that results obtained from the sample were approximately what would have been obtained if the entire population had been measured. The simple random sample allows all the units in the population to have an equal chance of being selected (Shadish et al., 2002). Here the selection of teachers entirely depended on luck or probability of finding them at school.

3.6 Data Collection Methods

A self-administered close-ended questionnaire (Appendix C) and a structured open-ended questionnaire (Appendix D) were administered to solicit quantitative data from students and teachers respectively. This method was used because it is a relatively cheap, quick, and efficient way of obtaining large amounts of information from large samples. Besides students and teachers are literates who were able to respond to the questionnaire because they can read, interpret and write.

An interview methodwas used to solicit qualitative data by probing with open-ended questions which would elicit views from head teachers to give an in-depth understanding of the subject (Appendix E). These were triangulated with quantitative data from teachers and students.

3.7 Data Collection Instruments

3.7.1 Questionnaire Guide

A close-ended questionnaire (Appendix C) containing three sections was administered to students. The demographic section sought information on age, sex, and type of school among others. Section B has 12 items on ICT Adoption based on three dimensions that are Infrastructure, Application, and Policy was adopted from (Seng et al., 2016). Section C having 12 items on the Use of leaner-centered pedagogies was adopted from (Emaliana, 2017) and measured on three dimensions that is; Problem-based pedagogy, Project-based pedagogy, and Inquiry-based pedagogy. The items were scored on a 5-point Likert scale, 1 (*strongly disagree*) to 5 (*strongly agree*). The study also soughtquantitative data on factors influencing ICT adoption using a structured open-ended questionnaire to the teachers.

3.7.2 Interview Guide

Interviews (Appendix E) were conducted with the Head teachers and recorded using a phone recorder with their permission. These were later transcribed, organized and interpreted. Their responses helped to give views about the subject that were used to complement the data obtained from questionnaires.

3.8 Research Procedure

The researcher obtained an introduction letter from Busitema University (Appendix A), followed by a letter from the District Education Officer (DEO) of Namayingo district allowing the researcher to carry out research in the secondary schools. Questionnaires were distributed to individual sampled participants in the schools by the researcher after interacting with the head teachers. The participants filled out the questionnaires and gave them back to the researcher immediately.

3.9 The Quality of Data Collection Instruments

3.9.1 Validity of the questionnaire

The content validity of the items in the questionnaire intended to collect quantitative data was tested by availing them to twoexperts other than my supervisors who checked whether the items on the questionnaire conformed to the objectives of the study and the results forwarded to the supervisors. The items considered relevant were identified and the content validity index (CVI) was calculated using the formula;

$$CVI = \frac{\text{No. of questionnaires considered relevant}}{\text{Total No. of questionnaires}}$$

The CVI = Number of relevant items (28)/Total number of items (30) was calculated and found to be acceptable as it was.82. This is according to Lynn's (1986) criteria where any CVI greater than

.78 will be considered excellent and items would be passed as relevant if they are tested by three experts' minimum and were all in perfect agreement.

3.9.2 Reliability

To ensure the reliability of the instruments, a pilot study was conducted comprising 35 teachersand 35 learners in two secondary schools in Namayingo District which did not participate in the study. Data from the pilot study was entered into the Statistical Package for Social Sciences (SPSS). Cronbach's alpha was obtained and the overall value of $\alpha = .78$ which is above the recommended .70 (Amin, 2005) for a reliable instrument. The values of Cronbach α for the subscales were .78 for ICT adoption and .77 for learner-centered pedagogies respectively. These values meant that the scales used were consistent and reliable.

3.10 Data management

The questionnaireswere collected from all the participants, and those which were not filled out were sorted out. The remaining questionnaireswere coded and data was entered in the SPSS to prepare for analysis. Qualitative data from interviews was recorded using a phone recorder, transcribed and interpreted. After this, the analysis was done using interpretive phenomenological analysis which aimed at providing detailed examinations of personal life experiences before moving to generalized claims. The following data score ranges were used to determine the score levels and divided into three equal parts low, moderate, and high as indicated in Tables 3.4 and 3.5 below.

Table 3.4: Descriptive Statistics Score Levels per item

Level	Low	Moderate	High
ICT adoption	**1.0-2.3**	**2.4-3.7**	**3.8-5.0**
Use of learner-centered pedagogies	**1.0-2.3**	**2.4-3.7**	**3.8-5.0**

Table 3.5: Descriptive score levels

Item category	**Low**	**Moderate**	**High**
ICT adoption	12-24	25-37	38-50
Use of learner centered pedagogies	12-24	25-37	38-50

3.11 Data analysis

For objectives one and two, quantitative data from students' questionnaires was entered into SPSS for analysis. Descriptive statistics, frequency scores, mean and standard deviation were used to determine the level of ICT Adoption and use of Learner-centered pedagogies.

Objective three which intended to establish the relationship between ICT Adoption and the use of learner-centered pedagogies, Pearson product-moment correlation coefficient was used to determine the magnitudes of the correlation using qualitative data from students'questionnaires.

For objective four, quantitative data from structured open-ended teachers' questionnaire was organized into themes and analyzed by content, tallied and ranked using percentages. Participants' opinions were subdivided and integrated into the quantitative data. This information

was triangulated with qualitative data from the interviews which were analyzed using discursive approaches including recordings of catching verbatim statements about ICT Adoption and the use of learner-centered pedagogies

3.12 Ethical considerations

Creswell (2014) outlines two primary categories of ethical norms in a study: research needs and individual protection.The researcher got a letter from the university allowing him to go to the field and collect data, Permission to carry on the study was also got from the DEO and the top management of the secondary schools selected for the study.

The researcher also gotthe consent of each participant of the study (Appendix B) who were assured that their participation was voluntary; the researcher assured the participants of their confidentiality and anonymity. Permission was also obtained from respondents before recording the interviews.

The researcher explained to the participants the aim of the study, stressing that it was for academic purposes. Honesty was to be maintained throughout the research process in reporting data, results, methods and procedures to avoid fabrication, falsification or misrepresentation of data.

Due respect was given to the respondents' privacy and confidential treatment so that the names and identities of the participants were not revealed.

All sources of information and materials such as journal articles, newspapers, reports, books and book chapters that were used in the study were acknowledged using citation and reference.

Chapter Four

Data Presentation, Interpretation and Analysis

4.0Introduction

This chapter focuses on presenting, analyzing, and interpreting the findings. This has been accomplished in line with the study's objectives. The researcher utilized frequency distribution tables to display data and incorporated brief quotations to strengthen the qualitative data. Pearson Product Moment correlation coefficient was utilized to determine the link between Teacher ICT Adoption and the implementation of Learner-Centered Pedagogies in secondary schools in Namayingo District

4.1 Demographic Features of the Participants

This section discusses the background information of the participants (students) who were relevant to the study. The class, gender, and school funding level of education were of great relevance to the study. The analysis was done in frequencies and percentages as shown in Table4.1 below

Table 4.1: Demographic Information of the Participants (n = 346)

Category		Students' Frequency	Percentages
Class	S.1	38	11.0
	S.2	54	15.6
	S.3	91	26.3
	S.4	116	33.5
	S.5	33	9.5
	S.6	14	4.0
Gender	Male	216	62.4
	Female	130	37.6
School Funding	USE	240	69.4
	Non-USE	106	30.6

Source: Field Data (2022).

According to Table 4.1 above, it was established that the majority of the student participants were from Universal Secondary Education schools (USE) 240(69.4%) indicating that USE schools in NamayingoDistrict have greatly participated in the study compared to Non-USE schools 106 (30.6%). This could be attributed to the Government initiative to avail USE schools with ICT equipment and training of teachers through workshops freely how to integrate ICT in the teaching and learning process and the government policy of providing free secondary education in every sub-county throughout the country.

Furthermore, it was noted that there were more males 216 (62.4%) who responded than females 130(37.6%). This could be attributed to the attitude that females have towards ICT

adoption. This may be because most females are reluctant to discover and learn new things and perhaps, they believe that computers are for males hence rendering the ICT field male-dominated (Singh, et al. 2018).

It was also noted that the S. 4 students responded more than all other classes 116(33.5%). This could be because of most secondary schools' policy/preference of only allowing candidates' classes to access the ICT tools because some of the candidates register for ICT as one of the examinable subjects at the O-level. Also, most students likely get serious with their studies when they reach S.4. They probably carry out their revision using ICT tools as compared to S. 1 and 2

4.2 Objective One: To assess the level of Teachers' adoption of ICT in secondary schools in Namayingo District.

This section deals with descriptive statistics of each item score assessing ICT adoption in secondary schools in Namayingo District. The objective was analyzed using a research question: How has ICT been adopted in secondary schools in Namayingo District?

According to the results in Table 7 below, it was assessed that the level of ICT adoption was generally low as scored by the majority of students' responses. The mean scores of all the respondents lay between the score ranges (2.08-2.30), which were low, according to the descriptive statistics levels described earlier in Table 4 on data management. These scores show that; there were insufficient ICT tools for the students (M=2.21, SD 1.37), there were limited numbers of technological pedagogical ICT specialists (M=2.16, SD=1.18, there was limited connection of ICT tools to the internet (M=2.25, SD=1.44), there was inadequate access to ICT search engines (M=2.30, SD=1.20).

Table 4.2: Scorelevel of Teachers' adoption of ICTsecondary schools in Namayingo District.

	N	Minimum	Maximum	Mean	Std. Deviation
There are enough ICT tools in relation to the students' number.	346	1.00	5.00	2.22	1.37
There are technological pedagogical ICT specialists	346	1.00	5.00	2.17	1.17
There is an ICT laboratory/ store for the ICT tools	346	1.00	5.00	2.15	.96
There is access to ICT search engines and are easy to use	346	1.00	5.00	2.30	1.20
There is a specific ICT school software application	346	1.00	5.00	2.28	1.25
There is a school e-mail and website for educational use	346	1.00	5.00	2.11	1.36
ICT tools are connected to the internet	346	1.00	5.00	2.25	1.44
My School follows NCDC guidelines while implementing ICT	346	1.00	5.00	2.16	1.19
There is an ICT policy at school	346	1.00	5.00	2.17	1.06
There is a plan for retooling teachers by the school and ministry	346	1.00	5.00	2.32	1.13
Teachers follow ICT policy while teaching	346	1.00	5.00	2.08	1.17
Valid N (listwise)	346				

In addition to the above analysis, the aggregated results (Descriptive Statistics) were *M* =23.15, and *SD* =7.37 as reflected in Table 4.3 below. These results show a low level of ICT adoption among secondary schools in Namayingo District as indicated in table 5.

Table 4.3: Aggregated scores of **Teachers adoption ofICT adoption; (Descriptive Statistics)**

N	Minimum	Maximum	Mean	Std. Deviation
346	17.00	50.00	23.15	7.37

Interviews

These results concur with interviewee 4.3, (24th March 2022) who says that "we as a school have ICT gadgets but they are not connected to the internet moreover, these gadgets are not enough compared to the number of students in school for example S.4 students in my school are 145, while the gadgets are only 25 meaning that holding practical lessons is difficult all the time, for they have to be done in shifts once in a while". This implies that students do not get enough practice on ICT tools and therefore are not well exposed to digital literacy.

Also, interviewee 2, (23rd March 2022), said "We have ICT on the syllabus; however, teachers with enough skills to teach ICT are not available in these rural schools for example in my school only one ICT teacher is teaching from senior one to senior six. Sometimes the students go without lessons". This implies that ICT teachers are few, and in those schools that have them, they are not enough to handle the big numbers; hence no effective learning takes place.

In addition, interviewee 4, (24th March 2022), said that "We have solar power which was supplied by the government; however, this form of power is unreliable since the batteries have worn and Suppliers take long time to replace them yet the school do not have sufficient funds to purchase new ones". This means that most times both teachers and students do not use the ICT tools, therefore, rendering ICT adoption ineffective.

Interviewee 1, (23rd March 2022), also said that “our school benefitted from the cyber school network which was supplied by the government but it is no longer functional and only those who offer ICT as a subject are the ones allowed to access ICT room and not often”. This implies that there is no Learning Management system hence affecting the teaching-learning

process. Similarly, she said that "there is no ICT policy in school but teachers use NCDC policy guidelines issued to the school". This affects the seriousness attached to the teaching and learning of ICT, hence affecting ICT adoption in schools.

4.3 Objective Two: To assess the use of learner-centered pedagogies in secondary schools.

This section deals with descriptive statistics of each item score assessing the use of learner-centered pedagogies in secondary schools in Namayingo District. The objective is analyzed using a research question: How have learner-centered pedagogies been used in secondary schools in Namayingo District?

According to the results in Table 4.4 below, it was analyzed that the use of learner-centeredpedagogies was generally low as scored by the majority of students' responses because the mean scores of all the respondents lay between the score ranges (1.26-2.10), which were low, according to the descriptive statistics levels described earlier in table 4 on data management. This means that learner-centered pedagogies are not used instead traditional teacher-centered pedagogies are used in secondary schools in Namayingo District. For example, students are not responsible for their learning (M= 2.08, SD=.94), Students are not provided with more learning opportunities (M=1.26, SD=.83), students' language and writing skills have not been enhanced (M= 1.63, SD=1.16), Students are not responsible for their learning (M=1.85, SD=1.00). Similarly, Students' critical thinking skills are not enhanced (M=1.74, SD=99. The descriptive statistics scored in these items is low indicating limited use of learner-centered pedagogies.

Table 4.4: Showing scores of the use of learner-centered pedagogies

	N	Minimum	Maximum	Mean	Std. Deviation
Students are more responsible for their learning.	346	1.00	5.00	2.08	.94
Students are provided with more learning opportunities.	346	1.00	5.00	1.26	.83
Students are helped to prepare their learning better.	346	1.00	5.00	2.04	.92
Students' critical thinking skills are enhanced.	346	1.00	5.00	1.74	.99
Students are able to accomplish their tasks faster.	346	1.00	5.00	1.96	1.02
Teacher-student interaction and collaboration are promoted.	346	1.00	5.00	1.54	1.12
Student's skills for doing research are enhanced.	346	1.00	5.00	2.10	.99
Students are responsible for their learning.	346	1.00	5.00	1.85	1.00
Students' language and writing skills are enhanced.	346	1.00	5.00	1.63	1.16

Teamwork/ group work among students is promoted.	346	1.00	5.00	1.68	.98
Students adapt course content to their interests.	346	1.00	41.00	1.95	2.27
Students get sufficient knowledge to do their work with ease.	346	1.00	5.00	1.98	1.03
Valid N (listwise)	346				

Table 4.5: Aggregated scores of learner-centered pedagogies (Descriptive Statistics)

N	Minimum	Maximum	Mean	Std. Deviation
346	18.00	50.00	21.82	7.52

The aggregated results in table 4.5 indicated *M* =21.82, *SD* = 7.52. Results show a low level of use of learner-centered pedagogies in secondary schools in Namayingo District. These results concur with interviewee 5, (24th March 2022) who attests that learner-centered pedagogies are not used in her school as teachers are still stuck to the traditional ways of teaching, especially in S.3-S.6. This is so because S1-2 is anchored in the new curriculum which is learner-centered. The changes to learner-centered pedagogies are still being resisted by the teachers who are still stuck to the old curriculum. This connotes that most teaching in secondary schools in Namayingo District is traditional, not leaner-centered.

Also, interviewee 2, (23rd March 2022) said that "teachers are refusing to adapt themselves to the new curriculum and still stuck with their chalk and talk method which makes a teacher the center of teaching hence applying learner-centered pedagogies has become very

difficult because teachers are not interested to change" This implies that schools in Namayingo District are adopting learner-centered pedagogies but at a slow pace hence affecting learning effectiveness.

In addition, interviewee 3, (23rd March 2022), said that "some students are also reluctant to adopt discursive methods and teamwork. They want to do the work alone not in groups. This has created laziness and a poor attitude towards learning". This implies that students themselves have not accepted learner-centered pedagogies hence affecting teamwork and collaboration.

Relatedly, interviewee 4 (24th March 2022), suggested that "teachers and supervisors should be given thorough training to effectively use learner-centered pedagogies, and students be sensitized to embrace the same. This will enhance the use of learner-centered pedagogies which is still low in secondary schools in Namayingo District." This implies that the Ministry of Education should continue with the training of teachers in workshops to retool them and change their attitudes.

4.4 Objective three: To establish the relationship between ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District.

This objective sought to establish the relationship between ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District. The null hypothesis used to test the relationship stated that “There is no statistically significant relationship between ICT adoption and use of learner-centered pedagogies. The results in Table 4.6 below indicated that there was a positive statistically significant moderate correlation ($r = .38^{**}$, $p < .001$)between ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District as shown in Table 11 below and therefore the hypothesis was accepted. This indicates that ICT adoption is closely related to the use of learner-centered pedagogies. It could also mean

that if ICT is fully adopted in secondary schools, learner-centered pedagogies may improve compared to today where teaching and learning are done through traditional methods.

These results concur with interviewee 3, (23rd March 2022), who says that " when ICT is used appropriately in the teaching and learning we believe that students can learn how to do their work and become creative, hence the better result. This could also improve reading, writing and numeracy". This implies that if ICT adoption was fully embraced in secondary schools in Namayingo District, learner-centered pedagogies would also improve hence improving students' learning.

In addition, interviewee 5, (24th March 2022) says "We use learning approaches using contemporary ICTs in this school. It provides many opportunities for students 'learning where teachers make their lessons more attractive and lively by making students active and creative. Students who do ICT have a close bond with the computer labs compared to learning inside the classroom". This implies that in schools which have adopted ICT students could be encouraged to do their research and discover for themselves.

Also, interviewee 4 (24th March 2022), says "I believe ICT applications in the classroom also has helped some teachers to improve on their teaching methods; it has changed the way they deliver their lessons in the classroom. He further says that "ICT has brought teachers closer to the students, especially in computer laboratories". This could be because the teacher allows the students to do most of the work and he/ she acts as a coach, who monitors what the students are doing hence enabling them to think and create their work.

Table 4.6: Pearson Product Moment Correlation between ICT Adoption and the Use of Learner-Centered pedagogies in secondary schools in Namayingo District.

Correlations

		LEARCEP	ADORPICT
LEARCEP	Pearson Correlation	1	.38**
	Sig. (2-tailed)		.000
	N	346	346
ADORPICT	Pearson Correlation	.38**	1
	Sig. (2-tailed)	.000	
	N	346	346

**. Correlation is significant at the 0.01 level (2-tailed).

4.5 Objective four: Factors that influence ICT adoption in secondary schools in Namayingo District.

The factors that influence ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District were sought from teachers using a research question: What factors influence ICT adoption in secondary schools in Namayingo District? The teachers gave their opinions on whatinfluences ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District. The results were analyzed using thematic content analysis. The information was grouped into thematic content, tallied and ranked in percentages;

the highest-ranked thematic content showed the commonest factors that influence ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District. The responses are summarized in Table 4.7 below.

Table 4.7: Common factors that influence ICT adoption

Thematic Content	No. of participants	Percentage	Ranking
Power	62	50%	1
Institutional factors	33	27%	2
Skills and competencies/ease of use	14	11%	3
Teaching Materials	08	7%	4
Policy	06	5%	5

Source: Data from the field

The results showed that schools lacked Power in schools as they are predominantly rural schools. Power ranked number one which accounted for 50%. The participants noted that their schools do not have adequate power to run ICT tools and only use small solar plants just for lighting which cannot run ICT tools hence ICT adoption has failed thus failing in the use of learner-centered pedagogies. This means that few students and teachers are exposed to ICT.

Institutional factors

Secondly, institution factors ranked number two with 33 participants declaring that their schools have infrastructure and equipment which accounted for 27%. In addition to the lack of power, secondary schools in Namayingo District lack ICT laboratories in terms of buildings and computers. The few that were donated by the Government are not enough to accommodate the

many students, especially in USE schools and others are nonfunctional and it is only UCC (supplier) which is mandated to service ICT equipment which takes time for them to go to schools. Similarly, respondents also reported that there is a gap in leadership support in terms of teachers' training hence lack of leadership support, ICT instructional materials and equipment or resources centers to facilitate teaching and learning for both teachers and students impedes the use of learner-centered pedagogies in secondary schools in NamayingoDistrict.

Skills and Competencies/ Ease of Use

This ranked number three and according to the results only 11% noted that they have been trained in ICT and therefore have ICT skills and competencies and the rest, 89% said they did not know at all about the usage of ICT both for instruction and learning hence limited skills and competencies. This implies that the use of learner-centered pedagogies has failed because teachers lack extensive ICT competencies and skills to be able to select the most appropriate resources during the teaching-learning process as the use of ICT requires some basic training and skills.

Policy

This was ranked last according to the results of 05%. Participants stated that their schools lack clear school and Ministry of Education policies on ICT education but follow the NCDC guidelines during the teaching-learning process, especially in S.one and S, two classes where teachers are required to use Learner Centered Pedagogies instead of the traditional teacher-centred methodologies. Therefore, the lack of ICT policy in the education sector hinders continuous and sustained investments in the ICT infrastructure and connectivity by the Ministry of Education and its Partners and its use by teachers and students during the teaching-learning process.

Chapter Five

Discussion of Results, Conclusions and Recommendations

5.0 Introduction

This chapter presents consists of discussion of the results, conclusions of the study, recommendations, and highlights of possible areas for further research. The sections in the chapter are presented in order of the study objectives.

5.1 Discussion of Results

The purpose of the study was to find out how ICT adoption aids teachers' use of learner-centered pedagogies in secondary schools in NamayingoDistrict.

The objectives of the study were; i) to assess the level of teacher ICT adoption in secondary schools in Namayingo District ii) to assess the use of learner-centered pedagogies in secondary schools in Namayingo District, iii) to examine the factors influencing ICT adoption in secondary schools in Namayingo District, and iv) to establish the relationship between ICT adoption and the use of learner centered pedagogies used in secondary schools in Namayingo District.

5.1.1 Level ofTeachers adoption of ICTsecondary schools in Namayingo District

The results indicated a poor degree of ICT adoption in secondary schools in Namayingo District. There is minimal utilization of ICTs in secondary schools in Namayingo District. Administrators in both Government and Private schools agree that they possess ICT devices, but the quantity is insufficient in comparison to the student population in rural schools. The lack of internet connectivity may be attributed to its high cost. Schools in remote areas include ICT in their curriculum but lack qualified teachers to effectively teach ICT. Rural districts like

Namayingo have poor ICT adoption due to a scarcity of computers and insufficient people to support pupils.

These findings are in agreement with Buabeng-Andoh (2015) who identified three interconnected elements that influence ICT adoption in education: human, institutional, and technological issues.Personal variables in this context refer to a teacher's perceptions, attitudes, and skills in using ICT in the classroom. These elements are influenced by the teacher's educational level, age, gender, educational experience, and students' engagement with ICT. Institutional aspects encompass infrastructural and environmental preparedness in terms of structures and administration, whereas technological factors involve compatibility. The results revealed a scarcity of these resources in Namayingo District, which accounts for the poor ICT adoption in the area.

The study aligns with Habibu et al.'s (2012) findings on the challenges of using ICT in educational institutions, which are related to both material and non-material factors. The inadequate quantity of machines and software copies may be the material conditions. Non-material hurdles consist of teachers' inadequate ICT knowledge and abilities, challenges in incorporating ICT into teaching and limited teacher time. The findings indicated that secondary schools in Namayingo Districtfaced all the mentioned challenges.

These claims align with Davis' (1989) Technology Acceptance Model (TAM). Users' acceptance of a technology is determined by their opinions of its usefulness and ease of use in relation to job performance, as stated by the theory. The perceived utility and simplicity of use of a technology influence a person's behaviour towards using it, which is also influenced by their attitude towards the technology. User acceptability is crucial when external factors like system characteristics, environment, development process, and training of personnel are favourable.

5.1.2 The use of Learner-centered Pedagogies in secondary schools in Namayingo District.

The results indicated that the implementation of learner-centered pedagogies was often minimal. Teachers are still employing traditional, teacher-centered strategies throughout instruction. Teachers may be resisting changes to learner-centered pedagogies because they are still attached to the traditional curriculum. Teachers and supervisors lack comprehensive training in utilizing learner-centered pedagogies effectively, and students need to be encouraged to use these approaches. This may explain the low prevalence of learner-centered pedagogies in secondary schools in Namayingo District.

The results align with Emaliana's (2017) research, indicating that instructors who hold learner-centred teaching ideas may not necessarily implement learner-centered teaching in reality. Teachers seem to be more aligned with constructivist ideology than with actual constructivist teaching practices. Reigeluth (2011) stated that teachers may struggle to establish learner-centered classrooms due to a lack of understanding of learner-centered pedagogies and other obstacles, despite holding learner-centered ideals. The author stated that while teachers primarily held constructivist or a combination of constructivist and conventional views, their actual teaching approach was predominantly traditional or teacher-centered.

These findings align with Darsih's (2018) pilot project in schools implementing the 2019 curriculum in Kuningan, West Java. In schools, particularly those in distant locations with under-prepared students, learner-centered pedagogies are acknowledged to be ineffective. It is evident from various data obtained from interviews conducted with head teachers. The first issue is the lack of instructors' accountability. Some teachers enter the classroom, assign discussion topics, briefly depart then return after the discussion is over. While students may have the ability to do the task, proficient teachers need to be present in the classroom to assist, direct, and support their

pupils. Secondly, there is a lack of motivation among students. This is likely the most crucial factor to focus on in learner-centered teaching. Unmotivated pupils sometimes struggle to participate in classroom activities. These factors may contribute to the limited implementation of learner-centered pedagogies in secondary schools in Namayingo District.

5.1.3 The relationship between Teacher ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District.

The results indicated a substantial positive correlation between the use of ICT and the utilization of learner-centered pedagogies. ICT adoption could improve learner-centered learning approaches. The results show that ICT enables students to autonomously structure their learning process, providing them with an engaging educational experience. Students utilizing ICT are transformed from passive recipients to active users. ICT has facilitated closer interaction between teachers and students, particularly in ICT laboratories. The teacher facilitates the pupils' work and assumes a coaching role by overseeing their activities. ICT adoption promotes student autonomy in thinking and creating original work.

These statements align with Habibu et al.'s (2012) opinion that ICT is a versatile tool that may engage students in instructional activities to boost their learning and assist them in solving intricate problems to improve their cognitive abilities. The author argues that the integration of ICT should be interdisciplinary rather than being treated as an independent course or subject. ICT should serve as a tool to enhance educational goals such as developing skills in information retrieval and evaluation and fostering collaboration, communication, and problem-solving abilities crucial for preparing students for a knowledge-based society. Alkahtani (2017) found that incorporating ICT into teaching and learning is a challenging process that can present many problems. These issues are classified as external and intrinsic. External challenges include

access, time, support, resources, and training, whereas internal challenges consist of attitude, beliefs, practices, and resistance. The author viewed external issues as systemic rather than personal, whereas internal issues related to instructors, administrators, and students. Lawrence and Tar (2018) state that incorporating ICT into the curriculum requires teachers who are proficient in computer operation, programming, and software development. Without these, gaining ICT adoption becomes challenging.

5.1.4 The factors influencing ICT adoption in secondary schools.

The results of the study revealed power, institutional, manpower/skills/competencies, ease of use and teaching materials as the main factors influencing ICT Adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District.

Power

According to the results,most schools in Namayingo District predominantly rural lack adequate main grid electricity supply to run ICT gadgets. The participants noted that some schools use solar panels which were supplied by UCC which are even worn out andonlyused for lighting as they cannot run ICT tools. Even those schools connected to the power grid are decried of unreliable power due to frequent load shading hence ICT adoption has failed this may lead to teachers' failure to use learner-centered pedagogies. This result concurs with Burns et al, (2019) who state that across the African continent, many secondary schools lack electricity or fuel to run generators, or updated electrical systems, particularly in rural areas and slum communities.

This observation is in line with Siddiquah and Salim, (2017) report, where the majority of the participants identified power instability as the commonest factor that negatively influences ICT adoption and use in Pakistan educational institutions. They further assert that it is difficult to

implement ICT in education if power supply is not distributed in the national infrastructure, as fluctuation in electricity causes damage to expensive ICT equipment.

Institutional factors

In addition to the lack of power, the study showed that secondary schools in Namayingo District lack ICT laboratories in terms of buildings and ICT tools and thatICT gadgets are not enough compared to the number of students in schools. This statement is in agreement with Burns et al, (2019) who opine that, secondary schools in Africa lack adequate laptops or desktops, a physical space for ICT tools, security, and clean environments. For the effective adoption of ICT and the use of learner-centered pedagogies in secondary schools, the availability and accessibility of ICT resources are paramount. Hu, (2017) concurs with above the statement as he asserts that effective adoption and integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware and software. Therefore, if ICT adoption is low, then its usage in a classroom by teachers is affected.

Similarly, participants also reported that there is a gap in leadership support in terms of teachers' training. Leadership support can take a variety of forms which include: encouraging or discouraging the adoption and integration of ICT explicitly, through expressed preferences and mandates. According to (Buabeng, 2019), Leadership engages the acquisition and coordination of all the factors influencing ICT adoption and the use of learner-centered Pedagogies within the settings and limitations of the institution in defining and realizing the preferred result. Therefore, School leadership may be a stronger predictor of teacher’s adoption and use of ICT in teaching as effective utilization of ICT by teachers may depend on a strong school leadership that drives well-designed technology plans in schools. The above statement is in agreement with Jakhar, (2015) who asserts that a leader who implements technology plans and also shares a common

vision with the teachers stimulates them to use technology in their lessons. However, Lawrence and Tar, (2018) on the other hand observe that the lack of appropriate administrative support for the effective use of ICT is the major barrier to its integration into education.

Skills, Competencies and Ease of Use

The results further showed that the majority of the secondary schools in NamayingoDistrictdo not have enough ICT teachers hence inadequate teachers' skills and competencies to teach ICT as 89% said they did not know at all in the usage of ICT both for instruction and learning.Teachers are agents of change in schools and drivers who play important roles in the implementation of ICT in education. This means that ICT adoption and the use of learner-centered pedagogiesdepend on the teachers who decide on how best to influence knowledge based on teachers' belief that technology can be useful when applied in the teaching-learning process. Therefore, teacher's attitudes towards ICT influence their acceptance of the usefulness of technology and also influence them to whether adopt and use ICT in their classrooms or not, (Ghavifekr, et al 2016).

These results concur with Lawrence and Tar, (2018) who attest that a teacher who has an ICT skill or knowledge, is in a better position to judge the usefulness of adopting and integrating ICT into teaching and learning activities.Mukhula et al, (2021) also hold a similar view whenthey say that the skills and attitudes of the learners and teachers determine the effectiveness of technology integration and ICT policy implementation in the curriculum.

5.2 Conclusions

Based on the findings above, the study therefore concludes that there is a low level of ICT adoption among secondary school teachers in Namayingo District. This means that ICT is not widely used in secondary schools despite being integrated into the curriculum. This could be

because of the so many challenges that are being faced in the process of ICT adoption hence the need to overcome them with time.

In addition, there is a low level of use of learner-centered pedagogies in secondary schools in Namayingo District. This means that the conventional teaching approach still takes the lead in our secondary schools. This could be a result of inadequate training of teachers in ICT skills and attitude change, lack of motivation of students, and resistance to change. Therefore, all the stakeholders need to come on board to put strategies to solve the above obstacles to enhance learner-centered pedagogies.

Although schools may undertake ICT adoption and use of learner-centered pedagogies, there are factors which are likely to influence this process. These include, power, institutional factors, manpower/skills, teaching materials and policy. Therefore, the Government through the Ministry of Education and Sports and school administrators need to constantly devise new ways to routinely engage teachers and students in training, to provide ICT gadgets and power.

There is a positive statistically significant relationship between ICT adoption and the use of learner-centered pedagogies in secondary schools in Namayingo District. This relationship implies that ICT creates learning environments that enable students to become responsible for their learning and focus on process and outcomes specifics for their individual learning needs. ICT also improves students' ability to write, speak and analyze information for their individual and personal growth. However, ultimately the power of ICT will be determined by availability and the ability of the teachers to use the new tools for learning.

5.3 Recommendations

The following could be recommended to enable the Government and school administrators to improve on ICT adoption and use of learner-centered pedagogies in secondary schools in Namayingo District.

Although ICT has been integrated into the school curriculum, school administrators seem to be implementing ICT adoption without necessarily following Ministry of Education and Sports guidelines. Therefore, it is recommended that thorough supervision of ICT adoption should be done consistently by the Government, exhaustive training of teachers be done, more ICT gadgets be provided to schools and electricity or alternative sources of power be extended to schools.

In addition, since Learner-centered teaching is not learning without teachersbut starts with the teachers, it is recommendable therefore that teachers be given thorough training. This training should be school-based in order to change their attitude and to equip them with skills that can enable them to change from teacher-centered pedagogies in which they were trained to learner-centered pedagogies.

As ICT is integrated into the current curriculum it is recommendable for the government and other stakeholders to offer professional development for current and incoming teachers on ICT use and teaching. Also learning tools and toolkits for use in the school and within the digital media and learning network should be designed. More computers and solar power systems should be availed to schools by stakeholders.

5.4 Areas for Further Study

The low levels of ICT adoption among secondary schools in the Namayingo Districtindicate that there could be challenges in the ICT adoption process. A study should be

done on the challenges faced by stakeholders in ICT adoption among secondary schools in Namayingo Districtto make improvements.

This study unveiled factors that are responsible for influencing ICT adoption. A detailed study ought to be done to investigate these factors to give an in-depth picture of all factors that are responsible for ICT adoption, and how they can be mitigated to enhance the use of learner-centered pedagogies.

This study was carried outin only Namayingo Districtwhich may not be representative enough. A wider study covering other parts of the country, especially the rural Districts could give an overall picture of ICT adoption and use of learner-centered pedagogies nationwide. This will aid in better decision-making.

5.5 Limitations of the Study

Data quality control of qualitative data was not ensured i.e. the researcher did not go back to the participants or interviewees to verify whether what was transcribed exactly represented their views. The investigator concluded that the information obtained from participants was reliable and credible because after interviewing a certain number, a point of saturation was attained (the responses were similar).

Another limitation of the study lay with the population. Results in the study are largely based on the views of administrators, teachers and students of secondary schools in Namayingo District. This means that further research needs to be done in other districts and more education institutions in order to come up with a bigger picture of ICT adoption and use of learner-centered pedagogies generally.

This study never hadanobjective regardingtheextraneous variables and yet they may influence whether teachers' adoption of ICT enhances their use of learner-centered pedagogies.

Therefore, more research should be done on the effects of extraneous variables to find out the factors influencing teachers' adoption of ICT.

To limit the number of questions, only onequestion was used to collect data from the teachers on the factors influencing their adoption of ICT which has brought a weakness in the results. Also, the quality of the research instruments may have affected the results hence the weakness of the study.

References

Adam, L.,Butcher, N.,Sibthorpe, C. and Tusubira. T,(2012). ICTs for education in Africa; *e transform Africa:* The Transformational Use of ICTs in Africa.

Ali, G., Haolader F. A, and Muhammad, K. (2013). The role of ICT to make teaching and learning effective in higher institutions of learning in Uganda. *International Journal of Innovative Research in Science, Engineering and Technology* Vol. 2, Issue 8.

Alkahtan, A. (2017). The challenges facing the integration of ICT in teaching in Saudi secondary schools:*International Journal of Education and Development using Information and Communication Technology* Vol. 13, Issue 1.

Ajibade, P. (2018). Technology Acceptance Model Limitations and Criticisms: Exploring the Practical Applications and Use in Technology-related Studies, Mixed-method, and Qualitative Researches. *Library Philosophy and Practice (e-journal).*

An, Y. and Mindrila, D. (2020). Strategies and tools used for learner-centered instruction. *International Journal of Technology in Education and Science (IJTES),* 4(2), 133- 143

Baguma. G. K., (2020). *Guidelines to Schools on Implementation of the New Lower Secondary School Curriculum*; National Curriculum Development Centre; Kampala.

Basri, W. S., Alandejani, J. A., and Almadani F. M. (2018). ICT Adoption Impact on Students' Academic Performance: Evidence from Saudi Universities. *Hindawi Education Research International,*https://doi.org/10.1155/2018/1240197.

Buabeng-Andoh, C.(2019). Factors that influence teachers' pedagogical use of ICT in secondary schools; A Case of Ghana. *Contemporary Educational Technology,* 10(3), 272-288.

Buabeng-Andoh, C. (2015). Teachers' ICT usage in second-cycle institutions in Ghana: A qualitative study. *International Journal of Education and Development using Information and Communication Technology*, Vol. 11, Issue 2, pp. 104-112.

Burns, M., Santally, M. I., Halkhoree, R., Sungkur, K. R., Juggurnath, B., and Rajabalee, Y. B., (2019). *Information and Communications Technologies and Secondary Education in Sub-Saharan Africa*; *Policies, Practices, Trends and Recommendations.* MasterCard Foundation report.

Buza K. and Mula F. (2017). The role of the Teachers in the integration of ICT in Teaching in Secondary Lower Education. *European Journal of Social Sciences Education and Research*. Vol 4, Issue 4.

Chavez, J. A. M, Hernandez, C. U, Osores, J. J. V. Alcoser, S. D. I. (2020). Integration of ICTs and digital skills in times of Covid-19Pandemic; *International Journal of Higher Education Vol. 9, No. 9.*

Creswell, J. W. (2014). *Research design: Qualitative, Quantitative and mixed methods approach,* 4th ed. Lincoln. Sage Publications, Inc.

Darsih, E. (2018). Learner-centered learning: What makes it effective? *Indonesian EFL Journal,* 4(1), 33-42. DOI: 10.25134/ieflj.v4i1.796.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and use acceptance of Information Technology. *MIS Quarterly,* 13(3), 319-339.

De-Graft, D, J., (2018). Assessing the Use of Information and Communication Technology in Teaching and Learning in Secondary Schools. *Library Philosophy and Practice.* http://digitalcommons.unl.edu/libphilprac/2003

Dele-Ajayi O, Fasae OD, Okoli A. (2021). *Teachers*' *Concerns about Integrating Information and Communication Technologies in the classrooms*. PLoS ONE 16(5): e0249703. https:// doi.org/10.1371/journal.pone.0249703

Dolores, M. H., &Enerst, C. W. (2018). Enhancing teachers' performance through training development in Ghana education service (A case study of Ebenezer senior high school). *Journal of human resource management,* 6 (1).

Emaliana, I. (2017). Teacher-centered or Student-centered learning approach to promote learning. *JurnalSosialHumaniora*Vol.10 Edition 2

Farrell, G. (2007). *ICT in Education in Uganda; Survey of ICT and education in Africa*. Uganda Country Report.

Fathim, S. (2013). Challenges of ICT in Teaching Learning Process; Research Inventory: *International Journal of Engineering And Science* Vol.2, Issue 12. Pp 51-54.

Fischer, R.B. (2017). *The evolution of technology: Early, middle and current stages*. The Washington Post.

Garanga A. R. (2019), *importance of using information and communication technology in learning, teaching and working process*. Zhejiang University, China.

Gellerstedt, M., Babaheidari, S., M. and Svensson, L. (2018). *A first step towards a model for teachers' adoption of ICT pedagogy in schools*; doi10.1016/jheliyon. 2018. e00786

Ghavifekr, S., Kunjappan, T, Ramasamy, L., and Anthony A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions; *Malaysian Online Journal of Educational Technology* Vol. 4, Issue 2.

Gnanam, S. P, Vetrivel, S., and Raju,B.R.V.R. (2016). Approach for Integrating ICT in Teaching- Learning Process; *International Journal of Trend in Research and Development* Vol.3 (5).

Gonçalves, E. and Capucha, L. (2020). Student-Centered and ICT-Enabled Learning Models in Veterinarian Programs: What Changed with COVID-19? *Educ. Sci. 10, 343; doi: 10.3390/educsci10110343.*

Gutierrez, D. (2018). *The birth of modern technology*-50 years ago to now. A look at how far we have come. Inside BIGDATA, Newsletter.

Habibu T, Mamun A.A. and CheKum C. (2012). Difficulties Faced by Teachers in Using ICT in Teaching-Learning at Technical and Higher Educational Institutions of Uganda; *International Journal of Engineering Research & Technology.*Vol.1 Issue 7.

Hrast,S. andSavec, V. F. (2018). ICT-supported inquiry-based learning; *World Transactions on Engineering and Technology Education*, Vol.16, No.4.

Hennessy S, Onguko B, Harrison D, Angondi E K. Namalefe S. Naseem A and Wamakote L. (2010). Developing the Use of Information and Communication Technology to Enhance Teaching and Learning in East African Schools*;Centre for Commonwealth Education and Aga- Khan University Institute for Educational Development* – Eastern Africa. Research Report No. 1

Hu, C. (2017). Students, computers and learning: Where is the connection? *Educ Inf Technol*22:2665–2670; https://doi.org/10.1007/s10639-017-9670-6

Jakhar, S. (2015). Adoption and integration of ICT in teaching and learning in school's education; *International Journal of Transformations in Business Management*, Vol. No. 5, Issue No. IV, ISSN: 2231-6868.

Jin, X., Jiang, Q., Xiong, W., Pan, X., & Zhao, W. (2022). Using the Online Self-Directed Learning Environment to Promote Creativity Performance for University Students. *Educational Technology & Society*, 25 (2), 130-147.

Kennah, M., R. (2016). The Use of ICT in the Teaching and Learning Process in Secondary Schools: A Case Study of Two Cameroonian schools, Master's Thesis. *Department of Education Institute of Educational Leadership*. University of Jyvaskyla.

Khokhar,A.,J., and Javaid, S. (2016). Students and Teachers Perceptions of ICT Use in Classroom: *The Asian Conference on Technology in the Classroom*.

Lawrence, J E., and Tar, U A. (2018). Factors that influence teacher's adoption and integration of ICT in the teaching-learning process; *Educational Media International*, 55(4): 1-27.

Landon, S. N., Hite, J. S., Hite, J. S., and Mugimu, B. C. (2013).Technology and education: ICT in Ugandan secondary schools.*Education and Information Technologies*, 18(3), 515-530.

Luhamya, A. Bakkabulindi, F. E. K, and Muyinda, P. B. (2017). Integration of ICT in Teaching and Learning: A Review of Theories. *Makerere Journal of Higher Education* ISSN: 1816-6822; 9 (1), 21 – 36. DOI: http://dx.doi.org/10.4314/majohe.v9i1.2

Mathevula, M. D. and Uwizeyimana, D. E.(2014). The Challenges Facing the Integration of ICT in Teaching and Learning Activities in South African Rural Secondary Schools; *Mediterranean Journal of Social Sciences*. Vol 5 No 20.

Mbithe M. F, Maithya R, and Cheloti S. K. (2016), Influence of Teacher Competency on Integration of ICT in Teaching and Learning in Public Secondary Schools in Machakos. *Journal of Education and e-Learning Research*, 3(4): 143-149.

Ministry of Education and Sports, (2020).*Digital agenda for the Education and Sports sector;*Concept note. Kampala.

Ministry of Education and Sports, (2019). *The National Teacher Policy*, Kampala.

Ministry of Education, Sports, Science and Technology, (2016). *ICT monitoring tool for secondary schools*. Kampala.

Ministry of Information and Communication Technology, (2014). *National Information and Communications Technology Policy for Uganda*. Kampala.

Mognwaketse, M. O. (2018). Teacher dominated approaches: Their Implications for today's Inclusive Classrooms; *International Journal of Psychology and Counseling, 10(2).*

Mukelele, R. (2019). The ten challenges facing the implementation of ICT in Ugandan schools; *International Journal of Engineering Research and Technology* Vol. 01 issue 12.

Mukhula, G. J.,Manyiraho, D.,Atibuni,D., Z. and Olema,D. K.(2021). ICT Adoption Readiness and ICT Policy Implementation in Secondary Schools in Mayuge District, Uganda. *American Journal of Educational Research*, vol. 9, no.8 479-487. doi: 10.12691/education-9-8-3.

Muianga, X., Klomsri, T., Tedre, M. and Mutimucuio, I. (2018). From Teacher-Oriented to Student-Centered Learning: Developing an ICT-Supported Learning Approach at the Eduardo Mondlane University, Mozambique. *The Turkish Online Journal of Educational Technology,* volume 17 issue 2.

Mwapwele, S. D., Marais, M., Dlamini, S., & Van Biljon, J. (2019). Teachers' ICT adoption in South African rural schools: A study of technology readiness and implications for the South Africa Connect broadband policy. *The African Journal of Information and Communication, 24, 1-21*.

Newby L S., Hite J M., Hite J S., and Mugimu C B. (2012). *ICT in Ugandan secondary schools and information technologies.* doi 10.1007/s/0639-011-9180-x.

Noordin, M. K., Nasir, A.N., Ali, D., F., Nordin M., S.(2011). Problem-Based Learning (PBL) and Project-Based Learning (PjBL) in Engineering Education: A comparison; *Proceedings of the IETEC'11 Conference,* Kuala Lumpur, Malaysia

Nurjanah, S., Santoso H B and Hasibuan, Z A. (2017). An ICT Adoption Framework for Education: A Case Study in Public Secondary School of Indonesia. IOP Conf. Series: *Journal of Physics*: Conf. Series 801 (2017) 012029.

Ochwo, D., Atibuni, D. Z&Sekiwu, D. (2018). Efficacy of information and communication technology in digitalized students' records management in Universities in Eastern Uganda. *African Educational Research Journal,* 6(2): 99-106.

Olushola T, and Abiola J. O. (2017). The Efficacy of Technology Acceptance Model: A Review of Applicable Theoretical Models in Information Technology Researches. *Journal of Research in Business and Management* Vol. 4 Issue 11 pp.: 70-83.

Okuonzi J., Mugisha, B. and Muyinda, P. (2021). *Digital Education Standards and Guidelines for the Education and Sports Sector; Draft-1*.Ministry of Education and Sports. Kampala.

Pandey, A, and Kumar Pandey, A. K. (2020). ICT in Teaching and Learning: An Indian Scene;*Journal of Critical Reviews*Vol. 7, Issue 9.

Patel, P., and Patel, N. (2017). ICT Pedagogy for Effective Learning, Education and Quality Evaluation. *International Journal of Computer & Mathematical Sciences,* Vol. 6, Issue 5; pp. 2347 – 8527.

Phutela N. and Dwivedi S. (2019). Impact of ICT in Education: Students Perspective. International Conference on Digital Pedagogies; *Education Research Network*; http://ssrn.com/link/2019-Int-Conf-ICDP.html

Ponelis, S. R. and Holmner, M. A. (2015). ICT in Africa: Enabling a better Life for All. *Information Technology for Development*, 21 (1), 1-11.

Rastogi, A., and Malhotra S. (2013). ICT Skills and Attitude as Determinants of ICT Pedagogy Integration; *European academic research,* vol. I, issue 3 assn. 2286-4822.

Roy, M., Kihoza, P., Suhonen, J.,Vesisenaho, M., Tukiaianen, M. (2014). Promoting proper education for sustainability: An exploratory study of ICT enhanced Problem Based Learning in a developing country; *International Journal of Education and Development using Information and Communication Technology*Vol. 10, Issue 1, pp. 70-90.

Santhi, D. D. Y, Suherdi, D., Musthafa, B. (2019). ICT and Project-Based Learning in a Rural School: An EFL Context. Third International Conference on Sustainable Innovation; *Advances in Social Science, Education and Humanities Research,* vol. 353.

Savery, J. R. (2006). Overview of Problem-based Learning: Definitions and Distinction. *The Interdisciplinary Journal of Problem-based Learning*, vol.1, no.1.

Saxena, N. (2017). The Role and Impact of ICT in Improving the Quality of Education: An Overview. *International journal of engineering sciences & research technology,* 6(3).

Sealfon, C. (2012). Student centered teaching methods. Council of science and technology: www.princeton,edu/cst

Seng. C. L., Yiung,S, N,.Isawasan, P., Lee, C., K.and Lim, S., P. (2018). Factors influencing teachers' intention to adopt ICT into teaching using partial least square technique method.*AIP Conference Proceedings 2016,* 020076; https://doi.org/10.1063/1.5055478

Shadish, W. R. (2002). Revisiting field experimentation: field notes for the future. *Psychological methods*, *7*(1), 3.

Shuhua, M., &Quani, Y. (2015). *The evolution of information and communication technology in public administration.* Retrieved from*; http/ doi.org/10.1002pad:1717*

Siddiquah, A.and Salim, Z. (2017). The ICT facilities, skills, usage, and the problems faced by the students of higher education. *Eurasia Journal of Mathematics Science and Technology Education,* 13(8):4987-4994 DOI: 10.12973/eurasia.2017.00977a

Singh, S. Singh, S. and Kumar, A. (2018). Women and ICT: A study on access and perceptions in North India. *Indian Journal of Human Development,* 12(3), 401–419. doi: 10.1177/0973703018818588

Shimasaki, N. (2015). Integrating ICT into classroom pedagogies: an overview of barriers within the modern classroom.*Journal of Initial Teacher Inquiry,* Volume 1.

Srivastava, S. (2016). ICT implementation for Education and Learning; *Journal of Research & Method in Education*, e-ISSN: 2320–7388, p-ISSN: 2320–737X Volume 6, Issue 4

Uganda Communications Commission, (2014). *Integrating ICT into education in Uganda.* Status of implementation in the various Institutions.

Ukata, P. F, and Onueka F. A. (2020). Application of ICT towards Minimizing Traditional Classroom Challenges of Teaching and Learning during Covid-19 Pandemic in Rivers State Tertiary Institution; *International Journal of Education and Evaluation*, E-ISSN 2489-0073 P-ISSN 2695-1940 Vol. 6. No. 5.

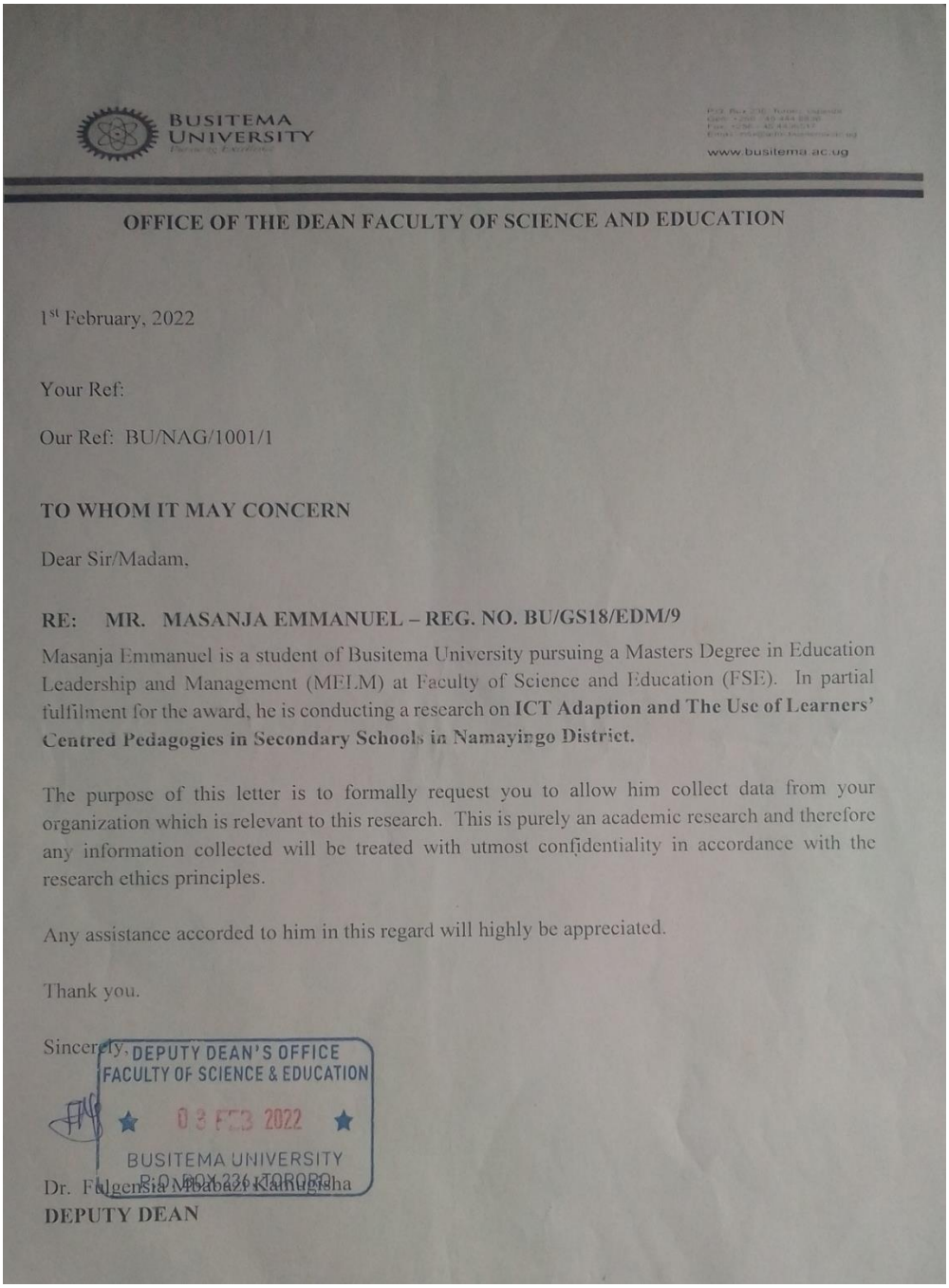
UNESCO, (2020). *Education in the time of COVID-19;COVID-19* Report ECLAC.

UNESCO, (2019). *Information and Communication Technology (ICT) in Education*. Planning Education for improved learning outcomes.

Vizo K. D, Mall M., Rout R and Parida P. (2020). Evaluation of ICT opportunities from student's perspective in the state of Nagaland, India, *Cogent Business & Management, 7:1*, 1842009, DOI: 10.1080/23311975.2020.1842009

Appendices

Appendix A: Letter of Permission to collect Data.



BUSITEMA UNIVERSITY

www.busitema.ac.ug

OFFICE OF THE DEAN FACULTY OF SCIENCE AND EDUCATION

1st February, 2022

Your Ref:

Our Ref: BU/NAG/1001/1

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: MR. MASANJA EMMANUEL – REG. NO. BU/GS18/EDM/9

Masanja Emmanuel is a student of Busitema University pursuing a Masters Degree in Education Leadership and Management (MELM) at Faculty of Science and Education (FSE). In partial fulfilment for the award, he is conducting a research on **ICT Adaption and The Use of Learners' Centred Pedagogies in Secondary Schools in Namayingo District.**

The purpose of this letter is to formally request you to allow him collect data from your organization which is relevant to this research. This is purely an academic research and therefore any information collected will be treated with utmost confidentiality in accordance with the research ethics principles.

Any assistance accorded to him in this regard will highly be appreciated.

Thank you.

Sincerely,

DEPUTY DEAN'S OFFICE
FACULTY OF SCIENCE & EDUCATION
03 FEB 2022
BUSITEMA UNIVERSITY
P.O BOX 236 TORORO

Dr. Fulgensia Mbabazi Kamugisha
DEPUTY DEAN

Appendix B: Consent Form for students

Busitema University

Faculty of Science and Education

Participant consent form

I …… agree to participate in this research whose purpose is to establish whether ICT adoption influences teachers to use learner-centered pedagogies in secondary schools in NamayingoDistrict.

1. I understand that the decision to participate in this study is entirely up to me and that even if I agree to participate now; I may withdraw my participation in the study at any time without any consequences of any kind.
2. I understand that I qualify to participate in this study by virtue of my position as head teacher/teacher/ student in one of the secondary schools in Namayingo District.
3. I understand that my participation in this study is purely voluntary without any direct benefit.
4. I understand that I am free to contact any of the people involved in this research to seek for clarification and information.

I have read and understood the information above.

Name of the participant…….

Signature of participant…….Date…….

Name of Researcher……..Signature…….

Appendix C: Close ended Questionnaire to the Students

Busitema University

Faculty of Science and Education

Dear Student,

I, Masanja Emmanuel, a student of Busitema University, am conducting a study on the topic "ICT adoption and Use of Learner-centered Pedagogies in Secondary Schools in Namayingo District, Uganda" in partial fulfillment of the requirements for the award of the degree of Master of Educational Leadership and Management. You have been identified to participate in the study by virtue of your position in this school as a student. I therefore kindly request you to spare some of your valuable time to respond to my questions. All the information that you provide will be kept with utmost confidentiality and will be used for academic purposes only. You need not to write your anywhere.

Thank you.

Section A: Background Information

Fill in the information in this section as indicated by either writing or placing a tick (√) in the box that you find most applicable in your case.

1. Your gender: Male ☐ Female ☐
2. Class: S. 1 ☐ S.2 ☐ S.3 ☐ S.4 ☐ S.5 ☐ S.6 ☐
3. School Type: Government ☐ Private ☐
4. School funding: USE ☐ Non USE ☐

:

Section B: ICT Adoption

This section consists of statements concerning ICT Adoption. Please indicate your level of agreement with each of the statements in the section by **ticking** (√)the appropriate box: Strongly Disagree (SD), Disagree (D), Strongly Agree (SA), Agree (A), and Not sure (NS).

S/N	STATEMENT	SD	D	NS	A	SA
1	The school has sufficient ICT tools in relation to the student					
2	The school has sufficient and adequate power to run ICT tools					
3	There is a technological pedagogical ICT specialist/ teacher					
4	There is ICT laboratory/ store for the ICT tools					
5	I have access to ICT search engines and are easy to use					
6	There is a specific ICT school software application					
7	There is school e-mail and web site for educational use					
8	ICT tools are connected to the internet					
9	There are ICT policy instructions to follow whenever need arises					
10	There is a plan for retooling teachers by the school and ministry					
11	The ICT specialist has well defined role in the school					
12	There is a copy of national ICT policy at school					

Section C: Use of Learner centered-pedagogies

This section consists of statements concerning Use of Learner centered-pedagogies. Please indicate your level of agreement with each of the statements in the section by **ticking** (√)the appropriate box: Strongly Disagree (SD), Disagree (D), Strongly Agree (SA), Agree (A), and Not sure (NS).

S/N	Statement	SD	D	NS	A	SA
1	ICT has made students more responsible for their own learning					
2	ICT has provided better opportunities for students' learning.					
3	ICT has helped has students to prepare their learning better					
4	ICT has enhanced students' critical thinking skills					
5	ICT has enabled students to accomplish their tasks faster					
6	ICT has enhanced teacher-student interaction and collaboration					
7	ICT has offered opportunities to students for doing research.					
8	ICT has made students responsible for their own learning					
9	ICT has enhanced students' language and writing skills					
10	ICT has promoted team work/ group work among students					
11	ICT has helped students to adapt course content to their own interest					
12	ICT has given students sufficient knowledge to do their work with ease					

Appendix D: Structured Open Ended Questionnaire to teachers.

Busitema University

Faculty of Science and Education

Dear Sir/Madam,

I, Masanja Emmanuel, a student of Busitema University, am conducting a study on the topic "ICT adoption and Use of Learner-centered Pedagogies in Secondary Schools in Namayingo District, Uganda" in partial fulfillment of the requirements for the award of the degree of Master of Educational Leadership and Management. You have been selected to participate in this study because you have valuable information and knowledge related to the study because of your position as a teacher. The information sought is required only for academic purposes. Participation is voluntary. I request you to respond with truthfulness and honesty for the success of the research. Remember that the information you provide will be treated with utmost confidentiality. You need not to write your name anywhere.

Thank you in advance.

Factors That Influence ICT adoption

This section comprises one question on factors that affect ICT adoption and use learner centered pedagogy. Please write you views in the space provided

What factors influence ICT Adoption in your school?

……

……

……

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Appendix E: Interview Guide for Head teachers

I, Masanja Emmanuel, a student of Busitema University, am conducting a study on the topic "ICT adoption and Use of Learner-centered Pedagogies in Secondary Schools in Namayingo District. You have been identified to participate in the study by virtue of your position in this school. I therefore kindly request you to spare some of your valuable time to respond to my questions.

1. Do you have ICT gadgets in your school? Describe.
2. How does ICT help students in their learning process?
3. How do your teachers use ICT in the teaching-learning process?
4. What methods of teaching do teachers use in your school?
5. How does ICT help in learner-centered pedagogies?

Thank You for Your Time and Kindness in Responding to my questions

Appendix F: Krejcie& Morgan Sample Population Table

Table determining sample size from a given population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Source: Krejcie, R.V., Krejcie& Wilson, C.Morgan (1970). Determining Sample Size Activities for Educational and Psychological Measurements, (30), 606-610, sage publications.

Note: "N" is population size;

"S" is sample size.

Appendix G: Similarity Index Report

turnitin

Similarity Report ID: oid:26567:195354701

PAPER NAME	AUTHOR
ME 2.docx	Charles Eryenyu

WORD COUNT	CHARACTER COUNT
13141 Words	77205 Characters

PAGE COUNT	FILE SIZE
45 Pages	72.9KB

SUBMISSION DATE	REPORT DATE
Feb 27, 2024 12:45 AM PST	Feb 27, 2024 12:46 AM PST

23% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

- 13% Internet database
- 6% Publications database
- Crossref database
- Crossref Posted Content database
- 19% Submitted Works database