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FACULTY OF SCIENCE AND EDUCATION

THE INFLUENCE OF DIGITAL RESOURCES IN THE TEACHING AND LEARNING OF
MATHEMATICS WITHIN THE COMPETENCE BASED CURRICULUM IN
CHEMWANIA HIGH SCHOOL LOCATED IN KWEEN DISTRICT,
EASTERN UGANDA

BY

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IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE
AWARD OF BACHELOR'S DEGREE IN
SCIENCE AND EDUCATION

APRIL, 2025

DECLARATION

I ARAPCHEROTICH KENNETH Declare that this research is my own original findings and that it has never been photo copied or presented to any university for any award.

Student's Name

Signature

Date

ARAPCHEROTICH KENNETH

.......

..30th:01:2025

APPROVAL

This research Report had been supervised and approved by

DR ASAPH KEIKARA MUHUMUZA

Sign.....

Date
.....30/04/2025.....

DEDICATION

I dedicate this art of work to my newborn child Natasha Chemutai, my beloved wife Dorcus Chekwemboi, my father Mathew Cherotich, my mother Agnes Chebet, my blood brothers Eliud Apron, Caleb Chemutai, Sisters like Ruth Chebet and many others, my uncles Jesse Chesang and faith Chebet and my real friends Mark Chebet and other relatives.

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I want to express my sincere appreciations to my dear lecturers for the guidance given while in this process of organizing my report for example Dr Asaph keikera Muhumuza my supervisor, Mr Alhaj Salim Guma, Mr Okiring Jackson not forgetting my lecturer for computer Dr Angole Okello Richard and many others who taught and inspired me to generate my own report through the skills imparted to me in both mathematics and computer studies.

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ABSTRACT

The use of digital resources is a fundamental part of being a university student. Hence, there is a growing interest in equipping students with the skills they need to thrive in a world that is full of technology and constantly changing. Moreover, the need to provide university students with the skills they need to succeed in a rapidly changing, technologically advanced society is also growing. It has become more common for the students to learn mathematics using digital technologies and conventional techniques as a result of recent advancements in both the world and technology. To ensure the future of mathematics students and society for the sustainability, technology, and education should collaborate. The study investigated how students felt about using digital resources to teach mathematics. This study employed a case study design and was qualitative in nature. The technology acceptance Model was employed as the theoretical framework which explains how to encourage users to accept and utilize new digital resources or technologies. Twenty second – year mathematics students who were specifically chosen to be information – rich participants were the pool. Data were collected using semi - structured interviews. The collected data was analyzed using thematic analysis. The findings revealed that students had a positive attitude towards embracing digital tools to learn mathematics. However, they encountered some difficulties as they learned mathematics using tools.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The introduction of the competence -based curriculum in Uganda today has brought about significant changes into the education sector which mainly aims at developing learners who capable and competent, skilled and knowledgeable in various subjects including mathematics and therefore Based on my observation and many individual reports made in analyzing the influence of digital resources during the implementation of the Competence Based Curriculum (CBC) in the teaching and learning of mathematics in USE schools today, Mathematics as a fundamental subject in the Ugandan education system clearly participated in upgrading the use of digital resources in understanding its concepts and it was found out that an estimate of 80% of the students today have been exposed to digital equipment's such as smart phones, laptops, especially in Kween district particularly Chemwania High School in Eastern Uganda and also other neighboring districts like Bukwo in the East and Kapchorwa in the west of Kween district.

Education is one of the pillars for the economic development and improvement of human welfare through imparting knowledge and skills to an individual to boost his or her livelihood either commercially on the use of digital resources like computers and many other methods that are applicable in the daily life. As the rate of educational competition grows stiffer towards the use of digital resources in the teaching and learning process of mathematics then also education becomes an important source of competitive advantage as it was linked to the economic growth and development for the country to attract education as an investment and hence creating more employment opportunities to the young generation in the next 21st century (Srivastava 2002). Education therefore appears to be one of the major determinants of sustainable life-long earnings to the people in the digitalized century.

In recent years (2020), there has been a growing interest in digital resources to enhance the teaching and learning of mathematics in Uganda. The government of Uganda had promoted the use of Information and Communication Technologies (ICT) in education through heavily investing in the development of ICT infrastructures in schools and also desktop computers, smart phones were allowed to be used by students in secondary schools all over the country

particularly in Chemwania High School and they could appear digitalized to some extent since they were few by then and it is major aim was particularly to expand the access to digital resources which can improve the quality of education. At the same time, digitalization and the shift to a competence-based environment requires that educational institutions such as secondary schools, tertiary institutions like the University and other learning Centre's could develop individual ability and confidence to apply knowledge of using digital resources like computers in the teaching and learning process of mathematics especially in the new competence -based curriculum in the dynamic contexts. Digital resources have been identified as a means to attain the major educational objectives of teaching and learning mathematics in the new implemented curriculum (School Net Africa 2003).

Under the current trend in the educationalphenomenon, students should be the facilitators of digital knowledge acquisition rather than the information dispensers that they have historically been especially in higher education institutions. it has become common for the students to learn mathematics using digital resources and convectional techniques as a result of recent advancements as a result of digital technologies to facilitate student learning.

1.2 Statement of the Problem

The successful integration of digital resources into the classroom aims at careful planning and depends largely on how well policy makers understand and appreciate the dynamics of such integration (Stronge 2018) and these can influence the teaching and learning of mathematics in the competence-based curriculum specifically in Chemwania High School. The recent modification in the Education curriculum was based on the changing technology which is currently adopted into the society and can meet the needs of the forthcoming generation of 21st century learners. The foundation of the current frameworks for defining digital competence is a combination of technological and pentagogical determinism where by teachers and technology was viewed as the agents of change as the teachers are agents in selecting and utilizing tools and methods to integrate technology which can define their digital skills and as technology continue to advance, the connection between digital technologies and mathematics will continue to evolve and these can offer new opportunities for the teachers and students. However, some students in rural schools may experience challenges in terms of access to quality educational resources, the study may be explored by the way how students perceive the use of digital resources in the teaching and learning of mathematics in rural schools especially chemwania High School. The

Ministry of Education is to facilitate ICT as a universal tool for education in particular to stimulate ICT integration in various regions in the country(Khan, Hasan et al. 2012). However, while other countries have reported up to 41% of ICT integration in the teaching and learning, the proportion remains substantially slow in Uganda. Resources for education in chemwania high school, Kween district, eastern Uganda with particular focus on how technology is being used in the teaching and learning process of mathematics.

1.3 Purpose of the study

The purpose of this study was to assess the extent of the influence of digital resources in the teaching and learning process of mathematics within the new Competence Curriculum (CBC) in secondary schools particularly chemwania high school in eastern Uganda.

1.4 Objectives of the study

1. To determine the extent of accessibility of computers by the teachers and the students in the new CBC secondary schools like chemwania high school in Kween district.
2. To determine the level of teachers' and students' expertise in using digital resources while teaching and learning mathematics in chemwania High School.
3. To determine how digital resources can be integrated into the teaching and learning process of mathematics by the teachers and students of Chemwania High School.

1.5 Questions Research

- a) What is the extent of accessibility of computers and related peripheral devices to the teachers and the students to support E- Learning of mathematics during the new competence-based curriculum implementation?
- b) What is the level of teachers and the student expertise on digital resources in the teaching and learning process of mathematics in CBC?
- c) In what ways do teachers and students integrate ICTs in the teaching and learning process of mathematics in CBC?
- d) To what extent has the Ministry of Education and Sports been able to implement the ICT integration policy based on the objectives that have been implemented by schools in the Kween district, particularly Chemwania High School?

1.6 Scope of the study

This section specifies the boundaries of the study in terms of content and geographical spread, this study focuses extensively on the utilization of digital tools in the teaching and learning activities specifically in mathematics but does not only cover everything about the education system but it also focuses mainly on the Technological integration and its influence in the teaching and learning of mathematics in Kween district particularly Chemwania High School, Since the emphasis was on the influence of Digital resources in the teaching and learning of mathematics as a core learning subject.

1.7 Methodology used during the study

Questionnaire: A questionnaire will be administered to the teachers and the students in chemwania High school to briefly understand their level of competence in using digital resources to teach and learn mathematics.

Interviews: the method of interviews was used by face-to-face interaction was contacted by me with five students and one mathematics teacher.

1.8 Significance of the study

The study findings may be used to facilitate the effective use of digital resources in the teaching and learning process of mathematics by both teachers and students.

The study findings will also be useful to administrators, policy makers and other stake holders in education to determine the preparedness and to improve the quality of education in secondary schools particularly in Chemwania High School, Kween district.

1.9 Limitations of the study

Accessibility: it's found out that not all students can have access to devices in secondary schools.

Lack of motivations of the learners and other unskilled teachers by the trained personnel have also limited the utilization of digital resources like computers which are available because the clients fear to use them hence leading to under use of the available resources to satisfy teaching and learning of mathematics in various schools like chemwania in Kween district.

Inadequate infrastructure: Chemwania High School has a small computer laboratory which can easily limit the use digital resources in teaching and learning mathematics.

Teacher and learner preparedness can also limit the use of digital resources because many learners and the teachers have not acquired the adequate trainings about the use of digital resources in mathematics.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews and highlights the literature related to the study of mathematics and the importance of using digital resources in the new competence-based curriculum methods of teaching in the secondary school education which included the use group discussions and class presentations for example use of projectors. Studies have shown that digital resources can improve student engagement, motivation, and understanding of mathematical concepts. However other studies have also noted that the effectiveness of digital resources depends on various factors such as teacher training, infrastructure and curriculum alignment. The review was divided into the following: the concept of digital resources in the teaching and learning of mathematics and ICT equipment in schools and ends with the discussion on the theoretical frame work and conceptual framework upon which the study was based(Salawu, Shamsuddin et al. 2023).

2.2 The concept of digital resources in education

The integration of Digital Resources in the teaching and learning of mathematics has been considered as a topic of interest in the recent years, its major aim was to provide the overview of the current state of research of the influence of digital resources on mathematics as a key subject taught in the education system of Uganda. Digital resources can be easily considered as the Information and Communication tools; it can be basically inform of a hard ware, a software or both(Haleem, Javaid et al. 2022). There is an adviser to the teachers that they should not replace what they teach in mathematics but see ICT as a tool just like a calculator, a pen or a chalkboard that help them to teach and students to learn(Johnston-Wilder and Pimm 2016). Hodgkinson (2006) and Duplessis (2010) noted three ways applying digital resources in the teaching and learning of mathematics in CBC schools today;

Learning about computers without any link to classroom practice.

Full integration with traditional goals where by computers can be used as a transmitter of knowledge resulting to just learning.

The third is full integration with constructivist learning space and context, implying that computers are taken as mediational or transformational tools resulting to learning with or through use of computers.

It was indicated that educators in the USA are able to put computers to good use in preparing teaching and learning materials such as syllabi, time tables and many others (Davies, Dean et al. 2013).

2.3 The Theoretical Framework

This study was explained using the Technology Acceptance Model which clearly states that the acceptance and use of technology depend on two factors which are the perceived usefulness and the perceived ease of use. and it also suggests that the use of digital resources in mathematics education depend on their perceptions of the usefulness and ease of use of these resources and mainly the Research was based on the modern human capital theory developed by Theodore W. Schultz together with another economist including Gary S. Becker, Jacob Mincer and Samuel Bowles. Human capital theory was based on the belief that individuals and societies at large derive economic gains by investing in people(Marginson 2019). The theory rests on the assumptions that formal education was highly instrumental and even necessary to improve the productive capacity of population that in turn fuels economic growth(Fägerlind and Saha 2016) . The Technological Acceptances Model (TAM) serves as the theoretical framework for the study through which some data analysis and interpretations were conducted to explore the factors that influence and impact secondary students interests in online interactions via digital resources. When the students were introduced to the new technology, several factors affect their choice of when and how to utilize resources. However Technological acceptance Model looks at how people's intentions, beliefs and use of technology as it uses the utility perceived and ease use to ascertain its use hence influence use or not use of digital technologies for the mathematics learning.

2.4 Conceptual framework

The conceptual framework for the study was based on the Interactions-Design-Development-Implementation-Evaluation (IDDIE) model. The IDDIE model suggests that the effective integration of digital resources in education involves five stages which include Interaction, Design, Development, Implementation, and Evaluation. The framework was conceptualized on the variables used in the objectives. Several studies have investigated the influence of digital resources in the teaching and learning of mathematics on the education sector in Uganda. The study was mainly suggested that the use of digital resources has improved the student's mathematics cores in Ugandan primary schools and also that the teachers' perceptions of the usefulness and the ease of use of digital resources were significant predictors of their intention to use these resources in mathematics education. Despite the growing body of research on the digital resources on mathematics education in Uganda, there is still a need for more studies to investigate the factors that facilitate or hinder the effective use of digital resources in this context. This study aims at addressing the gap by examining the influence of digital resources on mathematics education in Ugandan secondary schools and therefore this was mainly based on the dependent and independent variables of the study and the relationship among others.

Figure 1 showing relationship between variable in the teaching and learning process of mathematics and ICT integration (Digital Resources).

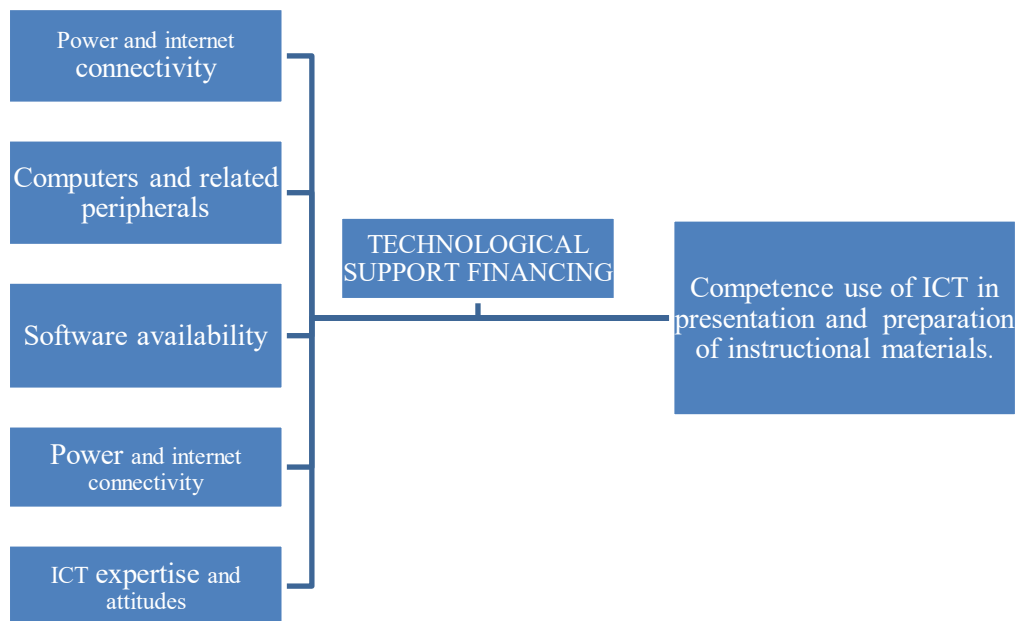


Fig2.1 shows the realization of the ICT integration vision in Education depends on availability of various variables in schools including among others are; computers, Education software, ICT skills and the internet connectivity.

In conclusion, this literature review has provided an over view of the current state of research on the influence of digital resources on mathematics education in Uganda. The review has highlighted the importance of considering the theoretical and the conceptual frameworks that underpin this research, the study findings are expected to contribute to the development of effective strategies for integrating digital resources in mathematics education in Uganda.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section covers research methodology used in this study and it usually outlines the research methodology that was used to investigate the influence of digital resources in the teaching and learning of mathematics in Uganda. The chapter provides an overview of the study and it was organized under the following sub – headings: research design, target population, sample size and sampling procedure, research instrument, instrument validity, instrument reliability, data collection procedure and data analysis. Its purpose was to provide a clear understanding of the research approach and the methods used to collect and analyze data. The research methodology was guided by the research questions and objectives that were outlined in chapter one. The study aims to explore the influence of digital resources on the teaching and learning of mathematics within the competence-based curriculum with the focus on secondary schools. The study will investigate the perceptions of teachers as well as the factors that facilitate or hinder the effective use of digital resources.

3.2 Research Design

A research design was defined as the structure of research that was organized to collect and analyze data to answer research questions and outlines the overall approach, methods and procedures for conducting the study. It holds all the elements in a research project together (Lukindo 2016). The study adopted a descriptive survey design. Kombo, (2006) defines descriptive survey as a method of collecting information by administering a questionnaire to a sample of individuals in order to secure evidence concerning all the existing situations and comparing the present conditions for the next cause of action and it will mainly employ a mixed – methods approach which will provide a comprehensive understanding of the influences of teaching and learning mathematics in Uganda. The research design has several types that is to say experimental design, quasi design, survey design, case study design and the mixed – methods design which also contains several data collection methods such as survey method with elements like questionnaires, interviews, and focus groups.

3.3 Target population

Kween district being my target sample frame population has 32 secondary schools and 23 are public schools and 9 schools are privately owned by rich individuals. The target population of 32 Head teachers and 568 teachers with 4760 students from all the 32 schools in the district these was based on school statistics Return DEOs office Kween district (et al 2023) in all the two counties. In particular Chemwania High School has a total population of 668 students with 68 staffs both teaching and non-teaching staff these was according to the school statistics contacted by teachers on duty every week. The sample size of my study was senior three class with three streams and my data collection particularly based on my questionnaires which were distributed to several participants which would help me in providing the required information for example 2 questionnaires were given to the school heads that is the head teacher and his deputy, 10 questionnaire were given to the s.3 teacher based on the teaching subjects and 15 questionnaires were given to the students 5 from each class using the probability method of choosing the gender participants.

3.4 sample Size and Sampling procedure

A sample size is a small group obtained from the accessible population while sampling is a research technique used for selecting a given number from the target population as a representative of that population Borg and Gall (1989). It was argued that if the population is less than 10000 and there will no estimate available of the proportion in the population (Levy and Lemeshow 2013). The sampling procedures will involve the following steps such as the stratified sampling, simple random sampling, cluster sampling. By justifying for the sampling procedures, the stratified sampling procedure will ensure that the sample is representative of the different types of secondary schools in Uganda. The simple random sampling procedure will ensure that every mathematics teacher and the students have an equal chance of being selected. The cluster sampling procedure will enable the researcher to collect data from a large number of respondents while minimizing costs and logical challenges.

3.5 Research instruments

The study sought for the empirical and qualitative data collection approaches. Data was collected from Chemwania High School using three sets of questionnaires. An observation checklist was used to confirm some facts of the questionnaires. Both open and closed ended questions were

used and these involves the use of some responses for example **yes** or **no** responses(Fielding, Fielding et al. 2013). The open-ended questions allowed the respondents to give a detailed explanation of the subject matter.

These research instruments can further be categorized based on the following situations of the data collected and these included;

3.5.1 Validity of the instruments

The validity of the research instruments is when the instruments measure what is supposed to measure (Streiner, Norman et al. 2024). It was further indicated that for a research instrument to be considered valid, the content selected and included in the questionnaire must be relevant to the variable being investigated(Rahi 2017). in study the instruments used to collect data on the influence of digital resources on the teaching and learning of mathematics in Uganda are as follows.

Questionnaires: self-administered questionnaires were used to collect data from the mathematics teachers and the students.

Interviews: semi-structured interviews were conducted with a subsample of mathematics teachers and various students particularly senior three class.

There are also various types of validity and these include;

Face validity: The questionnaires and interview guides were reviewed by experts in mathematics education to ensure that they appeared to measure the intended concepts.

Content validity: The questionnaires and interview guides were designed to cover all the aspects of digital resources and their influence on the teaching and learning process of mathematics.

Construct validity: The study used statistical methods such as factor analysis to ensure that the instruments measured the intended constructs.

3.5.2 Instrument Reliability

The reliability of instruments can be achieved when they yield consistent results or data after the repeated trial (Hopkins 2017). The same questionnaires were administrated to the same subject conditions twice within a week, the two sets of scores from each group were then correlated

using Pearson's products moments correlation coefficient (r)(Aletras, Kostarelis et al. 2010). The study employed the following methods to ensure reliability such methods include the pilot testing which only requires few questionnaires with a small group of respondents to ensure their reliability.

$$r = \frac{\Sigma xy - \Sigma x \Sigma y}{\sqrt{n[(\Sigma x^2 - (\Sigma x)^2)(\Sigma y - (\Sigma y)^2)]}}$$

Where x = score of the first test for each respondent

Y = score of the second test for each respondent

r = correlation coefficient of the scores in the two sets

n = number of respondents

According to agenda and Mugenda (2003) if r closer to one of the research tools are accurate.

3.6 Data collection procedure

There were mainly three sets of questionnaires that were administered as follows: one set to the school head, another to the subject teachers and a third set to the students and before these a study survey was conducted with respect to the observation method whereby, I was able to see by my eye sight the accessibility of digital resources by the students in chemwania High School

3.7 Data analysis techniques

The quantitative data was analyzed using descriptive mean, frequencies and percentages (Terry and Hills 2024), the qualitative data analysis was done using content analysis where ideas were achieved for example frequency distributions and percentages were obtained using statistical package for social science (SPSS).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the data collected from the field which was Chemwania High school. The findings of my research have been presented with respect to each of the specific research questions that guided my study as follows.

4.2 questionnaire return rate

A total of 15 students were selected from senior three classes which had three streams Red, Blue, Green among the total population of 165 students of senior three. These basically indicated that 15 questionnaires were distributed to 15 students where by 5 students were selected random from each stream, 2 questionnaires were given to the school administrators and 10 questionnaires were given to all the teachers teaching senior three class based on the teaching subjects and these can be based explained in the table below.

Table 4.3 Explains the questionnaire Return Rate

Respondents	Sample size administered	Actual Response	Percentage
Students	15	13	87
Teachers	10	10	100
Head teacher	2	2	100
Total	27	25	93

Table 4.3 indicates that the average response rate was 93%. According to researchers, it was found out that when the questionnaire return rate is above 80% then it is absolutely satisfactory

60% - 79% is said to be quite satisfactory, also a rate below 60 % is barely acceptable. This response was considered to be sufficient to provide reliable response.

4.3 Demographic data for the Respondents

The data presented in this part was obtained from responses by the students, teachers, Head teacher and the deputy in their respective questionnaires.

4.3.1 Distribution of students by Gender

Since the total population of students were 15 and it was very necessary and crucial to be gender sensitive, a random probability selection of gender was used whereby if a stream is chosen at random and then 5 students is selected out of the total population in a stream and assuming stream Red was chosen, then at most two boys and three girls should be selected and also done respectively to the remaining streams in a vice versa order.

Table showing gender distribution of senior three.

Streams

Gender	Red	Blue	Green	Total
Male	3	2	2	7
Female	2	3	3	8
Total	5	5	5	15

A pie chart showing students gender as illustrated above.

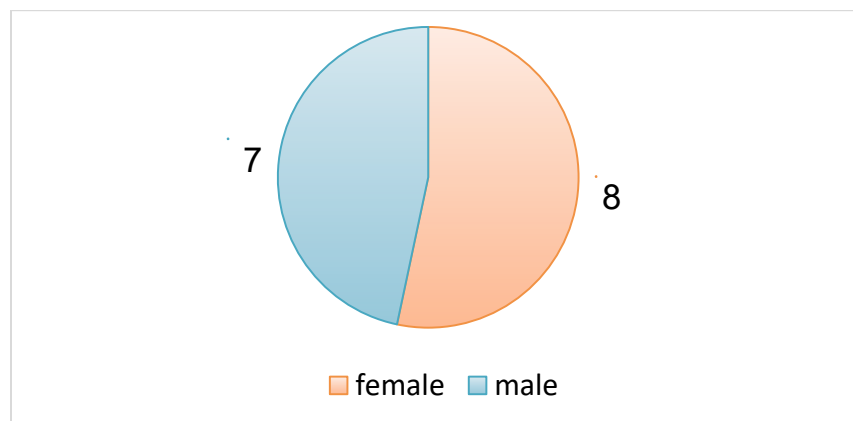


Figure 4.2 shows that the majority of students are females with 53% and this indicates that in one of the senior three streams, there are more females than the males with 47%.

Based on the extent to which digital resources has influenced the teaching and learning of mathematics, The study was mainly guided by the three research objectives, research questions and therefore the findings from the field have been reported as per the questions stated above. and they can be explained below:

4.4 What is the extent of accessibility of computer and related peripheral devices to support e-learning?

The Headteacher, teachers and students were asked several questions on the various aspects to determine the extent of access to computers and the other related peripherals and these are the responses obtained;

Regarding to the presence of electricity connection in Chemwania High School, it was reported by the head teacher that the availability of electricity in the school was the major enabling factor for the use of digital resources in the teaching and learning environment.

When the headteacher was asked to rate the power outage (blackouts) in the school based on always, often and never, the head teacher said there were blackouts. Als concerning the power blackout, the head teacher suggested /reported that there was a standby power energy both solar and a generator installed within the school premises to help students use these computer equipements while learning or incase there will be power shortage.

Pertaining the distribution of desk top computers in their schools, the head teacher was asked to give the number of desktop computers in a school and his responses were summarised in the table below.

Category of people	Number of computers	Cumulative number of computers
Head teacher	2	2
Teachers	5	7
Students	20	27

Total	27
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The table above shows that 20 computers were available for students teaching and learning purpose's, 5 computers were used by the staff to record there details for future use and only 2 computers were possessed by the head teacher and his deputy.

Also on the connectivity of computers in the school, the head teacher of chemwania High school reported that there was a stable wireless network within the school which enabled both teachers and learners to access ther online resources to faccilitate the teaching and learning process of mathematics. However the head teacher also stated that due to the increased cost of installing a stable network in the school settings, it had made it difficult atimes for the computer users to access more of the online resources which affects the teaching and learning process of mathematics.

4.5 What is the level of teachers and students expertise in ICT intergration / digital resources in the teaching and learning of mathematics?

Concerning the knowledge of expertise in using digital resources in the teaching and learning of mathematics in chemwania high school, there were various responses that were raised by the concerned teachers and students particulrarily senior three about the implimentation of digital resources in the teaching and learning process s.

Head teachers level of training on digital resources was found out that he had acquired some basic skills during workshops, seminors and he also reported that he had attained a certificate in computer studies and also pertaining the teachers level of training, it was found out that 60% of the teachers had basic knowledge in computers and 10% had a degree in computer studies while the remaining 10% had not attained any skill due to limited resources during there study years.

Figure 4.3 shows the teachers level of training

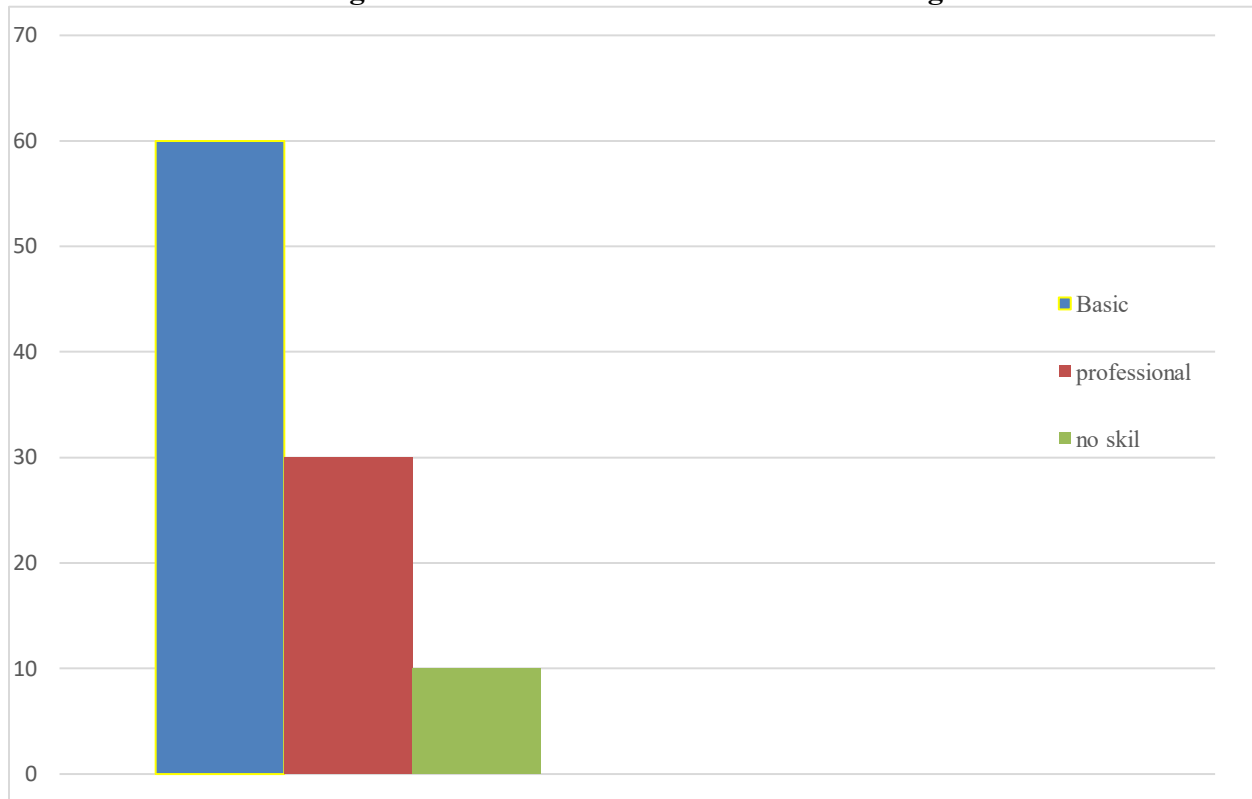


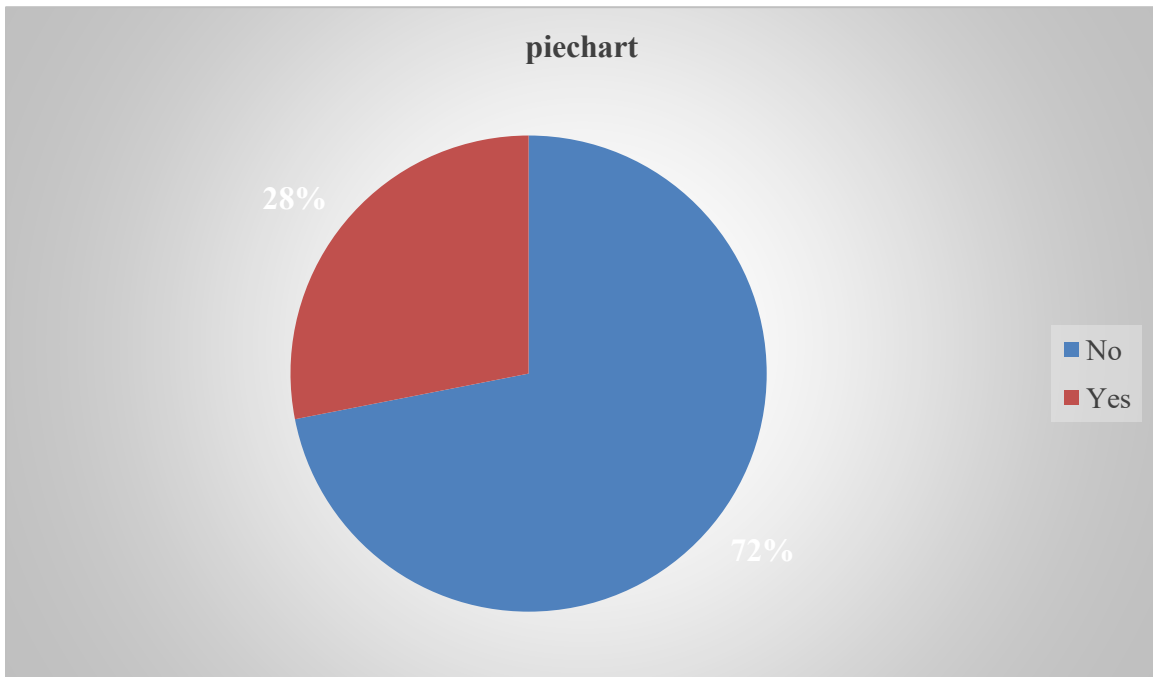
Figure above shows that the majority of the teachers approximated to 60% had been reported to have only acquired some basic knowledge, 30% of the staff are computer professionals and the remaining 10% had just concepts about computers but never attained any training about computer tools. Most of them reported that they had only received training for only 1-2 weeks.

The teacher's level of competency and confidence on some skills related to digital resources was analyzed based on the questionnaires given to the and skills that were tested included the teacher's ability to connect cables and switch on and off the computer, operating with the word application which included the typing skills and composing documents.

The level of teacher's competence on the digital resources was analyzed in terms of level of confidence expressed where by those who rated themselves as either good or very good in a given skill were regarded as to have a high confidence.

On the same note the student's level of ICT training was also determined where by students were asked if they had received any training in computers and their responses was indicated as shown in figure below.

Figure 4.4 shows the students level of ICT training



On the above pie chart, it was found out that the majority of the students 72% had not acquired the ICT training however much they have access to the digital resources but they cannot use them appropriately but the 28% number of students only received some skills from their friends and relatives who had the resources with them.

In what ways do teachers and students integrate ICT in the teaching and learning of mathematics?

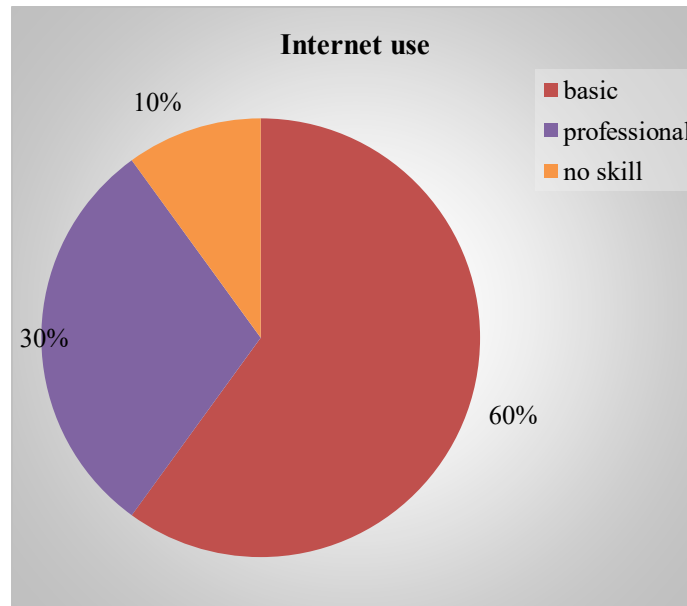
The Head teacher, teachers and students were asked several questions on the ways in which ICT can be integrated in the teaching and learning process and these were their responses as; Possession of the computer facilities, the headteachers Mr. Chemusto Nathan mella reported that the availability of the 27 computers has greatly encouraged the integration of ICT in the teaching and learning process since teachers and students have confidence to use the available resources appropriately.

The existence of 30% of the professional teachers and 60 % of the teachers with basic knowledge has also maximally encouraged the integration of ICT into the teaching and learning process.

Use of the internet by the teachers in preparing the learning materials, however since the largest number of teachers had only basic skills about computer which was approximated to be about

60% it made it difficult to integrate ICT to the teaching and the learning process of mathematics but also the availability of the 30% of the professional teachers is striving had to ensure the maximum use of the available internet connections hence motivating the teachers and learners in using ICT tools.

Figure 4.5 below shows the use internet in preparing the teaching and learning of mathematics



As shown in the figure above, the majority of teachers that is 70% indicated that they did not make use of the internet in preparing the teaching and learning materials. Out of those teachers that were using the internet as shown in the figure above indicated that most of them accessed the internet through their own mobile phones, it therefore indicated that mobile phones and smart phones had become useful tools to access the internet and download information by the teachers.

4.7 To what extent has the ministry of Education ICT Integration Policy objective been implemented by schools in Kween district?

The school head was interviewed with some questions relating to some key ICT integration policy objective as outlined by the ministry of education, National ICT strategy for education and

training, it was meant to establish the level of implementation of some of the objectives stated which include the following:

It was reported that about 25% of the schools in Kween district are yet to establish computer laboratories including Chemwania High School with just a small computer laboratory of not more than 27 computers. Pertaining to the existence of Local Area Network (LAN) that facilitates communication of the computers within an institution and sharing of the peripherals by the computers and also only 5% have installed LAN network in the school environment and yet the 95% have not installed the networks to their computers.

To equip education institutions with digital equipment's and internet connectivity; Digital equipment's imply the computers whether desktop and the laptop and related peripheral devices.

To develop educational software to meet local education requirements in the teaching and learning process. when they were asked to indicate whether they possessed some basic software, it was found out that only a few hard software.

There are also some challenges faced during the implementation of ICT in secondary schools and these include the following, these were mainly obtained when teachers and these were there responses;

Most teachers made their opinions that lack of adequate computer laboratory and fear of working with computers was considered as the minor challenge to a small but there are other major challenges that were stated by most teachers.

Teachers also added that the conservative nature of some of them whereby most of teachers are traditionally used to do telling than serious enquiry was a potential factor in hiding factor to ICT integration.

4.7.1 Challenges facing the implementation of digital Resources in Chemwania High School

Insufficient number of computers; There is a problem of limited number of computers in Chemwania High School in relation to the number of students to use them and these may limit the teaching and learning process of mathematics.

Inadequate copies of software of some specific subjects like mathematics which can also limit the teaching and learning of the subject.

Lack of interest by the teachers to use the digital equipment's in the teaching and learning of mathematics and these can also affect the learner's motivation on the use of computers.

4.7.2 Possible solutions to the above challenges

The school administration should ensure more looping of computers from the government in order to increase on the number of computers accessible to the students.

The school administration should ensure more installation of various software based the subjects taught in a school which can make the teaching and the learning process easier and more efficient.

The headteacher should motivate his teachers through other methods like increase of payments and also rewards to the teachers who have managed to use computers in the teaching and the learning process.

CHAPTER FIVE

SUMMARY OF THE RESEARCH FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, research findings, conclusions drawn, the recommendations for the study and the possible suggestions for further research which would enable other educationist either a student or the teacher to get the appropriate information to boost his or her daily teaching and learning experiences.

5.2 Summary of the study

The purpose of the study was to find the extent to which digital resources have influenced the teaching and learning of mathematics within the competence-based curriculum in Chemwania High School in Kween district.

The study was mainly based on the three objectives in order for the research to be more effective such that various outcomes of the study can be easily achieved and these can be simplified as follows; To determine the extent of accessibility of computers to the teachers and the students, to determine the level of teachers and students expertise in using computers and lastly was to determine the ways in which digital tools can be used in the teaching and learning process of mathematics.

On the literature reviewed, it mainly laid the background for the study which was based on two theories which included the conceptual and the theoretical framework of the study, the data mainly used was obtained through the use of questionnaire method which was administered to the two school heads (2), the teachers(10) and the senior three students (15) making a total of 27 questionnaires which were administered and during the collection of the questionnaire responses from the particular clients, it was found out that only 25 responses were received from the respondents and on top these the data collected was recorded on the table as explained in the above chapter, the observation method was also used as the confirmatory tool for the study which enabled me as the researcher to obtain the correct data by looking at the existing environment of Chemwania High School making me to conclude that there actually few digital resources in the school because the computer laboratory was just very small which could only accommodate view computers.

Through the use of rank correlation coefficient method which was stated in chapter three of these report, it was found out that the coefficient reliability of the instruments was approximated to be 0.86 which was considered to be a very high positive correlation.

The data collected were both qualitative and quantitative because almost all the data collection methods were applied for example observation method, survey method, interview method. the qualitative data was mainly analyzed using the descriptive statistics such as frequencies and percentages while the qualitative data for open ended questions were coded and transcribed per

research item. the data was analyzed and summarized to identify the main research findings and there after conclusions and recommendations were made.

5.3 Summary of the research findings

The summary of the research findings has been presented as per the research objectives in the study.

5.3.1 Extent of accessibility to the computers and other related peripherals; The study established that chemwania High School was equipped with some view computers and other related peripherals such as printers, laptops, modems and LCD projectors which were are also well connected within the well-established computer laboratory and it was also noted that the school was well connected to the local Area Network within the school environment which enable both the teacher and the students to access other online learning materials.

5.3.2 Level of expertise in ICT integration; it was noted that 80% of the teachers and students have received some ICT training which was further established that most teachers had acquired an ICT training of between 1-2 weeks duration and their skills level of attainment was tested, it was found out that most teachers and students demonstrated low level of confidence when using other Microsoft excel and many others and these showed that there was still capacity building gaps that should be addressed.

5.3.3 Level of implementation of ICT integration policy; Most ICT integration objectives have been implemented partially; the main objective of the policy was to increase ICT integration in the teaching and learning of mathematics which is still very low in Kween district particularly Chemwania High School. The implementation of digital resources in education is faced by various challenges including inadequate relevant e-content, insufficient teachers time, insufficient number of computers and lack of internet connection and therefore these challenges need to be addressed.

5.4 Conclusion of the study

From the research findings, it was clear that Chemwania High School had only installed only 27 computers and other related peripherals. However, they were not adequate for full ICT integration in the teaching and learning process of mathematics due to the fact that in the school there were ICT equipment's which were very few for the instance desktop and laptop computers

and LCD projectors. Generally, there was low extent of digital resource usage by both teachers and students and the implementation of the digital resources policy was influenced by various challenges that need to be addressed.

Recommendations of the study

The following are the recommendations of the study;

School authorities need to create more facilitation for more digital resources not only in the school but also in the classrooms including ensuring that all classes have appropriate infrastructures like sockets.

There was also need for curricula that is not reliant on text book and course coverage but one that allow room for deep enquiry which was supported by ICT as well as need to avail more relevant digital content for use in secondary schools.

Teacher's training colleges and universities should not only incorporate and strengthen ICT integration trainings in their teacher education programs but should also ensure that such trainings are based on equipping the student teachers with skills on the actual integration of digital resources in their respective discipline's.

suggestions for further research;

Similar study should be done in other regions for comparison purposes and in particular to enable a clear assessment of e -readings of chemwania High School.

Further research be undertaken on new pedagogical models that involve technology use and the conditions under which teachers and the students are motivated to adopt technology in the teaching and learning of mathematics.

Evidence based study was necessary to establish the real impact of digital resources in education especially in relation to the improvement in learning and performance in education especially in the teaching and learning of mathematics in chemwania High School.

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