Exploring the Extent to Which Digital Assisted Learning Contributes to Primary School Learning Outcomes. The Case of Selected Schools in Nkhata Bay District

By

Faith Nyirenda

A thesis submitted to the Faculty of Education in partial fulfillment of the requirements for the degree of

Master of Education in Leadership and Management

at

Mzuzu University

April, 2025

Declaration

I, **Faith Nyirenda**, declare that this dissertation on Exploring the Extent to which Digital Assisted Learning Contributes to Primary School Learning Outcomes. The Case of Selected Schools in Nkhata Bay District was properly researched and is my original work. It has not been submitted to any institution of higher learning in whole or in part for any academic award. Full acknowledgement is given where assistance was sought, most especially from my supervisor and where other views were quoted.

Faith Nyirenda

Sign  . Date 15/04/2025

Supervisor

Sign 

…… Date 15/04/2025

Acknowledgements

I would like to thank God almighty for the privilege I have to accomplish this journey, it has been challenging but it was wealthy it.

This work could not have been accomplished without the valuable contribution of the various people. Firstly, I am greatly indebted to my supervisor Dr. P. Zozie for the guidance and support for this research study. Secondly, I thank my Coordinator Dr. Margret Mdolo, and all the lectures, for the knowledge imparted to me for this exercise and beyond. My sincere thanks also go to the respondents of the sampled secondary schools, the students, head teachers, head of departments and the Quality Assurance officer at the Northern Education Division for sacrificing their valuable time to provide me with useful information for this study. Let me also acknowledge with gratitude the contribution of my fellow students of Master of Education students whose moral support enabled me to complete this work successfully. Lastly, I wish to extend my gratitude to my dear parents for their foresightedness to educate me. May God reward you abundantly!

Dedication

I dedicate this project to my late mother, Winnie Mphande and my brother Ephraim Nyirenda for the continuous support they have provided through-out my life.

May the good Lord bless you abundantly!

Abstract

This study explored the potential of digital resources in promoting primary education outcomes fostering inclusivity, particularly in remote rural areas, a case study of selected schools in Nkhata Bay district. By adopting a case study approach, the researcher explored the implementation of accessible digital books by the education technical program of Building Education Foundations through Innovation and Technology (BEFIT), Voluntary Services Organisation, World Vision Malawi, United States of Aid (USAID) and other implementing Organizations. However, the implementation of this program at primary school has come at a time when the curriculum has not yet been revised completely giving an impression that the materials in the introduced digital facilities do not match with the current curriculum hence raising questions about curriculum alignment and whether it contributes to the primary school learning outcomes. The study was guided by the following research objectives; to assess the current status of digital education implementation in the selected primary schools in the Northern region of Malawi, to explore how teachers integrate digital technology in their classroom arena, to identify the challenges and opportunities for improving the impact of digital education on students' learning outcomes and lastly, to discuss solutions to problems of integrating digital technology in classroom setting. The research was grounded in technological acceptance Model (TAM) and used oral interviews, classroom observation and document analysis where interview guide, classroom observation forms, and document analysis checklist as methods of data collection. The sample size to be used in this study constituted a total of 30 participants. The six primary schools were selected through purposive sampling comprising of 4 head teachers of the 6 schools, 14 teachers, 10 students, two from each school will also be sampled randomly from the concerned classes and finally, 2 Primary Education Advisors from zones where the researcher selected the participating primary schools

were targeted. The data collected was then analysed using content analysis, narrative analysis and thematic analysis and reported narratively. The study found that the program has to some extent helped to improve numeracy and literacy skills in learners though facing challenges of inadequate resources, less technical know-how on how to maintain the gadgets after they breakdown, less content to cover the whole curriculum subjects and lacks inclusive materials for the hearing impaired. It was therefore recommended that there has to be thorough orientation and continuous professional development for teachers, and proper coordination among curriculum implementing stakeholders to ensure equity distribution of resources.

Key Words:

Digital Assisted Learning, Digital education, Digital technology, BEFIT, implementation, integration,

Grocery of Terms and Abbreviations

MoEST	: Ministry of Education Science and Technology
OBE	: Outcome-Based Education
PCAR	: Primary Curriculum Assessment Reform
SSCAR	: Secondary School Curriculum Assessment Reform
MANEB	: Malawi National Examinations Board
MIE	: Malawi Institute of Education
MSCE	: Malawi School Certificate of Education
INSET	: In-Service Training
CPD	: Continuous Professional Development
BEFIT	: Building Education Foundations through Innovation and Technology
VSO	: Voluntary Services Organisation
Intended curriculum	: A curriculum that consists of the original ideas of curriculum developed

Table of Contents

CHAPTER ONE: INTRODUCTION

1.1 Chapter Overview

This chapter highlights the research background of digital education in Malawi's education system in relation to different education policy statements and documents. From this, a statement of the problem was developed which justifies the purpose of study. Objectives, research questions, sig nificance of the study and theoretical framework that guides this study have also been presented in this chapter.

1.2 Background of the Study

Digital education refers to the use of digital technologies to facilitate and enhance teaching and learning (SMOW, 2023). Not only addressing COVID –related issues, the Malawi government adopted digital education as in rural areas, the availability of qualified teachers, classrooms and teaching and learning materials has not kept pace with student enrolments, compromising the quality of education. Adopting digital education by Malawi government has been seen as a possible solution to improve learning outcomes through the Building Education Foundations Innovation and Technology (BEFIT) program.

The Malawi Government, supported by USAID, DFAT, WV's and many other organizations' field expertise, made a significant global impact on addressing COVID-related learning loss by leveraging a 10-year investment in All Children Reading Grand Challenge for Development. This program requires the use of digital tools in supporting learners on self-pace learning. The Malawi government in order to accelerate progress toward the Sustainable Development Goals (SDGs)

started implementing inclusive digital transformation in the year 2020. Further, USAID's Education Strategy states, Technology and innovation provide the opportunity to engage families and communities effectively and efficiently and reach marginalized and vulnerable populations—including those unable to attend school because of crisis or conflict, children engaged in child labour, persons with disabilities, and others.

In order to empower every primary school child in Malawi with the foundational literacy and numeracy skills; The Building Education Foundations through Innovation and Technology (BEFIT) programme in Malawi will serve all 3.5 million learners in standard 1-4 in every government school over six years. Digital education scale-up activities will also include transitioning the current Unlocking Talent programme to the government, reaching approximately 6% of public schools (338 schools). The program through the Ministry of Education and implementing partners will ensure scale-up activities progress equitably and as rapidly as possible across all of the 34 education districts in Malawi by 2030.

Malawi Government anticipates that scaling this programme country-wide will significantly increase foundational literacy and numeracy skills for students in Malawi. Past research has shown that the programme can also have positive effects on attendance, confidence and engagement in learning. It is also said that the program will be a catalyst to develop the wider digital education ecosystem in Malawi, increasing the capacity of schools and government as well as stakeholders from teachers to local software developers (Malawi Blief, 2021).

The goal of the BEFIT programme is to significantly improve student learning outcomes in literacy and numeracy through supplemental use of individualised, self-paced instruction delivered through a specialised app on tablets in Standards 1-4 in public primary schools in Malawi. The following are Programme Specific Objectives; Equip all 5,770 public primary schools from 2023-2029 with required technology and support systems to significantly increase attainment in literacy and numeracy skills among learners in Standards 1-4 in all public primary schools. Institutionalise the use of the technology as an alternative mode of instruction in primary schools to improve quality of teaching and learning by 2029 and beyond.

The programme targets all public primary schools across all districts and all learners in these schools enrolled in standards 1-4. In addition, the programme targets all District Education Managers, Primary Education Advisors, teachers, monitoring and technical support officers, national-level education leaders, and local school communities. The target numbers are based on education statistics of 2020, and it is expected that the numbers will likely change due to population growth over time (MalawiBlief, 2021).

The paper focuses on two Main education technology projects that are referred to Digital education. All children reading grand challenge for development and Building Education through Innovation and Technology supporting Primary school education in Malawi through EdTech. It also focuses on how they contribute to primary learning outcomes.

1.2 Statement of the Problem

One of the necessary steps the government has put forward to achieve the agenda 2063 is Human Capital development in science, technology and innovation (NPC, 2020). In education, the steps to achieve this enabler has been seen in the government's effort in distribution of digital learning materials in primary schools across Malawi. Studies on digital learning have presented a mixed results with some highlighting positive benefits while others presenting challenges. Studies by Gama et al (2022) and Kayange (2019) for example unearthed several benefits especially during the Coronavirus pandemic. This is based on research findings, among others, that this digital technology helps to facilitate skills development for life-long learning (Ghavifekr et al., 2012). However, the implementation of this program at primary school has come at a time when the curriculum has not yet been revised completely. Not only that, in Malawi, significant literature on digital learning focusses on higher education institutions and little is known about primary school level. This therefore, gives an impression that the materials in the introduced digital facilities may not match with the current curriculum. In other words, the curriculum content on the tablets used in the program may not align with the official curriculum or syllabus. If there is misalignment the efforts may lead to wasted resources, both monetary and time, as the government may have invested in digital education without ensuring that the content directly contributes to primary learning outcomes. It is for this reason that this study would want to explore the extent to which digital education, specifically technology-assisted learning using tablets, contributes to primary learning outcomes in Malawi.

1.3 The Purpose of the Study

The purpose of the study was to explore the extent to which digital assisted learning is implemented in primary school learning in Malawi.

1.4 Specific Objectives

Based on the research topic, this study had the following objectives in order to achieve its aim:

i. To assess the current status of digital education implementation in the selected primary schools in the Northern region of Malawi.

ii. To explore how teachers integrate digital technology in their classroom arena

iii. To identify the challenges of digital education on students' learning outcomes.

iv. To discuss solutions to problems of digital technology in classroom setting

1.5 Significance of Study

This study is significant for several reasons. Firstly, the study provides valuable insights into the development and implementation of a curriculum innovation in the context of Malawian education system and how curriculum can be reimaged to suit the fourth industrial revolution and the 21st century skills. Secondly, the study provides an enlightenment to education mangers and stakeholders on challenges any curriculum has faced in its implementation and therefore adding to the already existing knowledge in supporting calls that advocate for teacher training, orientation and continuous professional development. This at the end will help to inform policy decisions

aimed at improving the quality of education to develop targeted interventions to support curriculum implementation and the education system as a whole. Lastly, the unresolved issues from this study creates a basis for scholarly engagement and future research in this area of digital education.

1.6 Theoretical Framework

The study was informed by the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein in 1980. It is a theory that is very important in human behaviour and has its roots from social psychology. A key hypothesis of the theory according to Hagger (2019) is that individuals with greater control over their behavior will be more likely to carry out their intentions. TRA has three general tenets namely, Behavioural Intention (BI), Attitude (A), and Subjective Norm (SN).

Behavioural Intention (BI) is a person's supposed likelihood to engage in a given behaviour. It is regarded as the most proximal cause of behaviour. This behaviour intentions are said to be determined by attitude which is defined as one's evaluation of the behaviour. According to Paimin *et. al.*, (2016), intention represents the conative domain of psychology which is sometimes referred to as the "will" by many classical psychologist. The will is the defined as the spontaneity of movement and an element that mediates the link between feeling, action and desire or an act to of striving towards achieving goals that have been set (Paimin *et. al.*, 2016). Arguably, this conation is crucial aspect in engaging students in a learning, integration of technology, and hence is proposed as the main factor that influences performance to the level that it controls behaviour

where effort, will and intention is placed and decision is made to perform a behaviour (Paimin *et. al.*, 2016).

Attitude (A) on the other hand is how someone views and evaluates something or someone while Subjective Norm (SN). Subjective norm is described as a person's perceptions or assumptions about other people's expectations of certain behaviours that one will or will not perform and according to Hossein *et al.*, (2015), it stems from social influence and together with attitude are effected by an individual's beliefs.

In general, the Theory posits that "a person's behaviour is determined by their intention to perform it, which in turn is influenced by their attitude towards the behaviour and subjective norms. Is argued that among all the parts of TRA, "intention" impacts the behaviour directly, while others have an indirect effect. Here, it means that attitudes and subjective norms can predict the intention but not behaviour. Therefore as asserted by Hossein *et al*. (2015), the theory considers that behavioural intention is the key indicator of whether a specific behaviour is undertaken, and is influenced by a person's attitudes and subjective norms. TRA provides the framework where it is easy to recognise the key beliefs and norms which affect the behaviour and later can help individuals to plan for an intervention to change these beliefs.

For this study, the theory of Reasoned Action was used to evaluate the effectiveness of technological intervention in the teaching and learning situation in primary schools, on whether, it increased performance of students or not. Using the tenets of the theory, a prediction was made on

the results of the intervention and hence provide the intervention strategies to different stakeholders in curriculum implementation.

1.7. Chapter Summary

Chapter one has presented an overview of the study, s purpose and rationale. It has outlined the background to the problem under study, problem statement, research objectives, significance of the study and the theoretical framework by which this research is grounded in.

CHAPTER TWO: LITERATURE REVIEW

2.1 Chapter Overview

Integration of digital technology in the teaching and learning situation has been much advocated practice in the education system not only in Africa but globally. This chapter reviews the existing literature on how digital education technology assisted learning contributes to education outcomes. Overall, the chapter highlights how different education systems have integrated digital technology in their curriculum and the current status in terms of reception in the use of the technology. It reviews the literature on various digital learning models adopted by different education situations. Lastly, the chapter reviews literature on the challenges this integration of digital technology is facing in different countries.

2.2 The Status of Digital Education in Schools

One of the themes that have been studied by many scholars in the field of digital education has been the issue of the need that exist to integrate technology in teaching and learning especially, in this twentieth century. In Africa for example, digital education is said to be the key in promoting the realisation twenty first century skills in learners. There have been several factors that have necessitated the introduction and use of technology in schools in this 21st century. Jung (2000) talks about the huge challenges that teachers face in our society as knowledge is rapidly expanding. Modern technologies allow teachers to know how these technologies are to be used in their schooling. It raises teacher training demands with these new technologies. Gressard and Loyd (1985) confirmed that instructor machine behaviours are keys to the success of ICT implementation in school. They found out that teachers do not always have positive views about

technology and their negative attitudes will contribute to computer-based tasks becoming ineffective.

Furthermore, there is now a shift in the pedagogical approaches, with many advocating for reimagining curricula for the Fourth industrial Revolution (4IR). The fourth Industrial revolution is a technological revolution that is as argued by Schwab (2015) will alter our lives, work and the way we relate to each other and in its scope, scale, complexity and transformation is unlike humankind has experienced before. It is this urgency that require the curriculum to integrate technology that learners would embrace to develop the required skills. According to Menon and Gastrillon (2019) the 4IR will create disruptions for many occupations while at the same time opening up other new occupations like in the field of science, technology, engineering, data anaylsis and computer science and engineering. These professions, it is envisaged, require those who have blended digital and science, Technology and Mathematics (STEM) skills and traditional subject knowledge. Therefore it would be write for schools to embrace technology as early as possible to match with the growing need of the revolution.

Drawing from the Theory of Reasoned Action Osika et al. (2008) state that there are both internal and external factors that influence teachers to decide to incorporate technology in teaching. Among the internal factors according to them lie the individual beliefs, feelings of anxiety, fears, preferences and perceptions and feelings of competence. Studies, such as that of Kane et al. (2002) asserts that teacher's personal beliefs, perceptions, attitudes and orientations are correlated with their teaching practice. Another belief factor that has also attracted the attention of scholars in

analysing why teachers integrate or not integrate technology in their lessons is the view teachers have towards different teaching and learning practices and styles. It is argued that teaching and learning styles are based on the needs, emotions, motives, beliefs and attitudes of the teacher and that these practices when used positively, contributes to students' success (Fives & Gill, 2015).

Another important internal factor highlighted by scholars is the issue of competency. According to Osika et al (2008), teachers' competency in using the technology affects the adoption and integration of the same in the teaching and learning arena. Incompetency to use the technology on the other hand, also leads the teachers not to choose to incorporate technology in their classroom practices. This therefore, entails that while an education institution might be geared to adopt digital or technological innovation in the teaching and learning process, different factors affect the effective utilisation of the materials to support learning and realise the desired learning outcomes. This is in line with the observation by Solomon (2017) that teachers, as the classroom-level decision-makers, hold the key to the successful adoption and therefore, examination of factors that impact user acceptance of the innovation was deemed important in understanding the adoption of technology into classroom pedagogies.

2.3 Importance of Using Technology

Digital technology is what mostly affects the education system today due to its aspects of effectiveness, efficiency and attractiveness it offers both to learners and teachers. According to Arvindhan (2019), the role of technology in education is of paramount important: it is included as part of the curriculum, as a delivery system for instructional purposes and also as an instrument to

improve the entire process of learning. It is argued that in any situation, using technologies enhances the interpretation and learning of concepts. However, it is not just the use of technology but the efficacy of using it that contributes to the desired outcomes. For instance, Yan and Chao (2022) stated that an effective application of digital technologies enhances student interactions, manages students and classes, and promotes equitable digital technology access and uses among students. Integration of ICT is vital in the 21st Century era in that most students are already familiar with most of the technologies such as phones and according to Raja, and Nagasubramani, (2018) they learn better within technology-based environment. This is because; the use of technology in education contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and supports from ICT elements and components.

2.4. Impact of Digital Technology in Education

In modern times, educators constantly look for the technological tools that would enhance the learning of their students. However, as argued by Carstens et al. (2021), while technology has been viewed as a great resource in classrooms that has heightened learning, it has its negative effects on student learning. Different studies of the use of ICT in schools have produced mixed evidence with a pattern of null results and according to Bulman and Fairlie (2016), most of these studies target mathematics or sciences and not in other subjects like languages. Some studies also have shown a negative correlation between use of digital technology and educational outcomes. For instance, the study by Angrist and Lavy (2002) showed that computer instruction may be less effective than traditional instruction.

In their study, Fisher, et al. (2014) discuss how many today's classrooms are turning to technology for teaching and learning, and how teacher's roles have changed. They argue that the teacher becomes the facilitator, who takes the students on their learning journey, learning with them instead of 'teaching' them. Students need to make judgments about and be able to calculate the value of the content they gather. It is further argued that, with technology, learners also assess-themselves on how they are learning. All this at the end helps learners shift from just receivers or consumers of information to being producers of content.

It has also been indicated in some studies that using technology in teaching and learning helps to motivate learners in the process. Teachers are seen to be the very key to arousing the interest of students to learn. Research shows that while growing up in the ever-growing technology world, the incorporation of technology helps motivate students to learn. For example, Schaen, et al. (2016), discuss a project they conducted that allowed third grade leaders and first graders to work together and create an app that will allow kindergarteners to practice math strategies. This weeklong project allowed students to use technology, collaborate, and teach. Schaen, et al. (2016) study discussed the process that the students went through and the outcomes of the project. It was concluded that the project gave young students a real-world purpose for planning and creating collaboratively. Such is one the 21st Century outcomes the world anticipates to be realised in the education institutions.

2.5 Challenges Using Digital Technology

As there are many positive outcomes to technology in the classroom situation, there are some negative outcomes as well. It is noted that while technology gives students more information at a quick pace, there's also so much information that is incorrect or not appropriate for school (Ghavifekr, et al., 2016). This was seen as one of the problems that made make it difficult for teachers to monitor. In cases where technological use depends on internet connection, studies have shown that one of the top complaints of technology in the classroom is that it just does not seem to work at the time you need it to work and teachers are at the mercy of the server. This leads to frustrations among teachers as it delays teaching.

Some studies have also indicated that the use of technology becomes more of a management concern for teachers involved. In addition to lack of teachers' competency as noted by Ghavifekr, et al. (2016) the problem is aggravated by time taken for the students to log in the tablets. "The time it takes to get students logged in and logged out during a station that is 15 minutes long" ends up taking up half of the station. With the amount of time it takes, it can cause distractions. "Students will find ways to be distracted by the device they are using, such as doing random google searches during work time" (Ghavifekr, et al., 2016). Other studies have also found that technology has a tendency to increase distraction and dishonesty in some students.

According to the study by Ghavifekr, et al. (2016), other negative effects of technology is the availability of technology and the need for more staff and student training on these devices.

Teachers want to make sure students know where to go and what to do so that instructional time is not being interrupted. With students that need more guidance with technology, there is not much teacher time throughout the day to support them. In this study, one participant shared that their confidence in technology is not high and knows that there is more that they could be doing in the classroom with technology to enhance student learning.

Some studies have also highlighted technical difficulties in most schools, as a major problem and a source of frustration for students and teachers and cause interruptions in teaching and learning process (Ghavifekr & Rosdy, 2015). It is argued from the finding of their study that there were problems like lack of technical assistance in repairing the gargets, teachers not able to use them discouraged from using computers because of fear of equipment failure.

In Malawi a number of studies have also echoed the challenges facing digital education. Like other developing countries, Malawi faces many challenges like, cost of computers which so exorbitant to be afforded by most institutions, few computer trainees to meet the demand, many rural areas not connected to electricity, in adequate teacher capacity and limited continuous professional development (kayange, 2019: Saka, 2021). During the Corona virus Pandemic, Gama et al (2022) highlighted the challenges faced by higher institutions in integrating technology in teaching and learning coming from lack of preparedness to use e-learning platforms resulted poor patronage.

2.6. Chapter Summary

This chapter has highlighted some literature regarding the use and integration of ICT in education looking at its important, impact and some challenges of it. This has been done based on the research objectives and informed by the theoretical framework used in this study.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Chapter Overview

This chapter outlines the methodology that was used in the study. This includes the following areas under focus; research design, study area, target population, sample size and sampling procedures, data collection tools, limitations and delimitations of the study, the data analysis and ethical considerations.

3.2 Research Design

This study used a qualitative research design which involved a stress on the way people interpret and make sense of what they experience in order to understand the realities on the ground. It was an exploratory in nature as argued by Haradham (2018) helped the researcher to explain the "how" and "why" about the program under study through methods like interviews, observations,, interpretation and content analysis of visual and textual materials. This qualitative design in line with the theoretical framework because this methodology allows the identification of salient behavioral, normative, efficacy, and control beliefs associated with the implementation of the technological innovation.

3.3 Research Paradigm

There are many research paradigms namely, positivism, constructivism, critical theory and post structuralism. However, looking at the nature of this study it was right to situate this research in constructivist paradigm. This approach according to Neuman (2014.p.102) "emphasizes meaningful social action, socially constructed meaning, and value relativism." The researcher

therefore expected to get new information and interpret basing on the participants' views and understanding about the phenomena under study. Ideally, in constructivism the knowledge is subjective in nature where every participant's view was taken as part of the reconstruction of the phenomena under study and any conceptual understanding generated in the field of study on the topic was taken into consideration.

3.4 Research Site

The sample for the study came from the two school geographical zones in Nkhata Bay. It constituted the Kande zone and the Kachere Zone.

3.5 Study Population

The target population included 2 Primary schools, 2 Primary Education Advisors (PEAs), 2 Head teachers, 6 teachers, 14 students. The Interviews included 6 standards one to standard four teachers, three Implementers from NGOs and MoE. The researcher selected Standard 1, 2, 3 and 4 students since they were the ones who directly participate in the various forms of integrating the digital technology at the current phase in teaching and learning at primary school level. Teachers in the selected classes (1-4) were involved since they are the ones that interact with students and in these classes hence would provide the much-needed information for this study and they know the students at a personal level.

The PEAs formed part of this study since are key to each program implementation in their zones. They are preferred because of their close contact they have with head teachers and teachers providing guidance and Continuous Professional Development (CPD) to teachers. The head teachers of the schools are the custodians of ICT resources and were part of the study based on the view-by-view Silsil (2010) who contended that the head teacher ensure that proper methods of keeping and protecting school resources are maintained in the school.

3.6 Sample Size

Sample size is defined as the number of units, subjects, objects or items in the sample which determines the precision with which parameters are estimated and hence the accuracy of the inferences made from the sample data to the population (Mugenda, 2012). The sample size used in this study constituted a total of 30 participants. The two primary schools were selected through purposive sampling as recommended by Kothari (1991). The 2 head teachers of the 2 primary schools selected comprised the total sample representative of the 17 school head teachers. The 16 teachers of the 2 schools represented teachers from the 6 primary schools in Nkhata Bay, four from each school of classes 1 to 4. 14 students, from each school were sampled randomly from the concerned classes. Finally, 2 Primary Education Advisors from zones where the researcher had selected the participating primary schools were targeted. The sample size chosen was based on the importance each participant had towards divulging the needed information on the study. For instance the head teachers and peas were the key informants of this study while the total sample at the end was arrived due to data saturation.

3.7 Sampling Technique

This study used a purposive sampling technique to sample the Head teachers, and lower primary school teachers in the Nkhata Bay District Education Zones. According to Tongco (2007), as cited in Mwale (2015), the purposive sampling technique is a careful choice of participants due to the qualities they possess. Consequently, the PEAs, the Head teachers and teachers were purposefully sampled for the study as they formed the top bureaucracy in education zones and were decision makers in procurement and distribution of teaching and learning resources like ICT equipment and infrastructure.

Classes 1-4 were purposively sampled because that is where the program was being implemented. The researcher used a simple random sampling technique to sample 14 students in each class. Random sampling is used to choose participants where an individual has an equal probability of being selected from the population hence making the sample representative of whole the population (Creswell, 2011). Thus, the sampling technique was chosen to ensure that each student in the schools selected had an equal chance of being picked for the study.

3.8 Methods of Data Collection

The researcher collected data through, semi-structured Interviews, document analysis and lesson observations.

2.8.1 Interview guide

This is a set of questions an interviewer asks when interviewing respondents, (Orodho, 2009). Here, the researcher sought answers to a set of pre-conceived questions through personal

interviews. They usually yield high response rates. Data was managed by recording interviews using digital recorder. According to Anderson and Arsenault (1998), the interviews champion the value placed on individual participants and sanctions for in-depth analysis and pursuit of details geared to each participant. Similarly, Thomas (2009) points out that a great deal is provided by this personal contact, because the interviewee responds to the interviewer in bodily presence, unlike the way they would react to the questionnaire. This was administered to the head teachers to obtain their views on the adequacy of ICT resources in secondary schools, the attitude of teachers toward the integration of ICT in the teaching and learning and the extent to which digital integrated with the teaching and learning.

3.8.2 Lesson Observation

An observation guide was be used to collect data aimed at satisfying the set research questions and objectives. Thus, this research used the non-participatory approach to the unstructured observation. According to Kombo and Tromp (2006), this observation technique enables the researcher to take up the role of an onlooker and focuses on describing the studied phenomena. The researcher used an observation guide to acquire further information on the available ICT devices and their usage amongst the learners and teachers in selected schools of Nkhata Bay district.

3.9 Data Analysis Procedure

As regards this study, data was analysed through content, narrative and thematic analysis. Through content analysis, visual and textual data was examined and categorization of information was done in order to identify prevalent themes, patterns and relationships. This analysis method was chosen so that the researcher would have comprehensive understanding of the topic under study by

uncovering insights that would be difficult to surface through more open techniques (Maxwell, 2012). On the other hand, narrative analysis was used to examine the structure, context, and underlying meaning of the stories of respondents and their experiences and perspectives of the issues under this study. Lastly, thematic analysis was used in this study as it is flexible and inductive in nature to identify, analyse and report patterns or themes within the data. This thematic analysis was valuable to explore the breadth and depth of the qualitative findings of the study.

The data was transcribed word by word after listening to recorded files. The transcript was cross checked with document analysis notes. Coding was done as per the guidance of research questions and objectives, and bounded by the theoretical frame work, literature reviewed, issues raised as mentioned by respondents. According to Maxwell (2012) the goal of coding in qualitative research is not to come up with number counts like in quantitative research, but to fracture the data collected and rearrange it into categories. Sub-themes and new themes were formed from the coded information. Triangulation was done between data collected through oral interviews and documents to establish its trustworthiness.

Lastly, the researcher reported and interpreted data for its meaning as derived from all the data collection tools. The data was reported in a narrative manner highlighting themes and within the narration extensive samples of quotes, and any important part of documents that emerged from the process of data analysis. The interpretation of data involved relating and comparing the findings to previous published studies and literature relevant to the study. This helped the researcher to make inferences and at the end present reconstructions of meanings derived from the data.

3.10 Trustworthiness of the study

The following concepts were highlighted in ensuring trustworthiness of the study; credibility, conformability and transferability. Haradhan (2018) argues that credibility, conformability and transferability are critical in evaluating qualitative studies. Credibility is defined as the truth value of the findings. Haradhan (2018) describes conformability as the establishment of verifiable evidence from the experiences of respondents of the research while transferability shows how relevant can the study be replicated to similar situation, conditions and context. For this study, a variety of data collecting methods and instruments, like documents, oral interviews and focus groups, interview guides, recorders, observation checklist and field notes were used and cross-triangulated to enhance credibility of the data collected. In addition to these, the study also triangulated the response from participants to ensure consistence and true value of the information given in line with the advocacy of Klopper (2008).

The researcher also utilized the three months period observing the setting and situation of interest in the study to determine reliability of the information being collected. This is in line with what Fraenkel et al. (2012) stated on qualitative research reliability where it was asserted that the length of an observation is very crucial as consistency over time as regards what the researcher sees and hears is a strong indicator of reliability. Consequently, this helps to indicate transferability of the study. Voice recordings, pictures and videos also helped to ensure conformability of the information collected by the researcher. Fraenkel et al. (2012) defines validity and reliability in qualitative research as the appropriateness, meaningfulness and usefulness on the data collected and the consistency of inferences over time, location and circumstances respectively. Rich,

detailed and valued data that provided a revealing situation of what is going on was collected using digital recorder and in-depth interviews and where necessary respondent validation was be done.

Research objectives were also used to equip all the data collecting instruments to measure the study aims hence ensure content validity. The questionnaire and oral interview guide were structured and critically looked and analysed by external judges to evaluate content. Some data collection tools like interview guides, observation checklist and recorders were piloted to assess their efficacy so that where necessary, modifications would be made before a full role out in the actual research activity. This, as argued by Majid et al.(2017) helps to come up with a criteria for choosing potential participants and improving the interview guides especially questions after identifying if there are flaws or limitations.

3.11 Limitations and Delimitations of the Study

Being case study research, it is impossible to generalize the findings of the study to other areas outside the scope area of study as the results may vary with individual perception of the topic under study. However rich data was collected to come up with inferences easily. In addition, being a qualitative study some of the outcomes from the digital learning could not be quantified or observed within the designated period of the study. However, assumptions based on the outcomes of digital education in Malawi and other countries were used as standards to be matched with the advocated methods to attain them. On the same regard, standard 1-4 was targeted for interviews considering their experience in using tablets in learning.

3.12 Ethical Considerations

Ethical consideration is part of the research work, and cannot be avoided. Observation of research ethics helps to protect the rights of the research participants, develop a sense of trust with them, and promote the integrity of the research (Creswell & Creswell, 2018). The researcher made sure that the nature of the project, the procedure was adopted, the methods of collecting data, the selection of participants, and the nature of the data collected was ethically sound. Furthermore, before any data was collected, the researcher got permission for this study from the Department of Education foundation of Mzuzu University and Mzuzu University Research Ethics Committee (MZUNIREC). Also, the researcher obtained consents from the District Education Manager (DEM) in Nkhata Bay for data collection. Likewise, before, data collection, permission was be sought from the school authorities under the study. In addition, consents from participants were sought and anonymity throughout the process of the study was ensured. The study made sure that participants fully understood the nature of the research project without being deceived, as this helped the participants to choose whether to participate in an investigation or not. Participants' right to refuse to take part or withdraw once the research had begun was granted. An obligation to protect the anonymity of the participants and to keep the research data confidential was adhered to throughout the study. Finally, confidentiality was observed throughout the course of the study to ensure that the participants were not subjected to any harm.

3.13 Chapter Summary

This chapter has discussed the research methodology which was used in conducting this study namely: the research design, research site, population, and sample size, sampling technique, method of data collection, and data analysis as well as ethical considerations. Furthermore, the chapter has also described the ethical considerations, limitations, and delimitations of the study.

CHAPTER FOUR: PRESENTATION AND DISCUSSION OF FINDINGS

4.0. Chapter Overview

The results presented and discussed in this chapter are based on the research objectives of the study. The research first objective was, to assess the current status of digital education implementation in the selected primary schools in the Northern region of Malawi. The second objective was to explore how teachers integrate digital technology in their classroom arena. Thirdly, was to identify the challenges in implementing digital education on students' learning outcomes. The last research objective was to discuss solutions to problems of integrating digital technology in classroom setting. For the sake of ethical considerations, the researcher used numbers and letters in identifying the respondents. For example, teachers will be represented by T and a number, Head teachers will be represented by H and a number, PEAS will be represented by P and a number and the names of the schools will be represented

4.1. The Current Status of Digital Education implementation in Primary Schools

From what the researcher observed in the sample schools, the digital education is under implementation through the building education Foundations through Education and Technology (BEFIT). From the interactions, teachers acknowledged the good effort by the Malawi government in the implementation of the digital education through the provision of tablets where lessons are uploaded as seen in the following excerpt:

"We really appreciate the Ministry of Education for the provision of these tablets as learning resource……so far we have 200 tablets which we were

given by the Ministry. And we are using them for the benefit of the learners." (HT1. 5/9/2024).

The above excerpt was the common response from all the schools the researcher visited and appreciated how the tablets are used with different number of tablets given as per the number of students.as shown in the table below for two schools:

Table 1: Number of students against number of tablets per school

Name of School	Number of students	Number of Tablets
School A	266	96
School B	258	80

From the above table, it can be seen that the number of tablets are not enough compared to the enrolment. However, schools have developed sessions that alternate. On the infrastructure, one of the Primary Education Advisors (PEA) explained that at first the program was run by VSO and constructed resource rooms in primary schools for unlocking talent with focus on few students. However, after the partnership with the government, and the other support from other key partners, a lot of tablets were supplied that meant that many students would participate in the teaching and learning situation using the gargets. This meant that the initial rooms could not be conducive for the number of students, hence the use of normal classroom. When asked about organisations that are key partners in the primary school digitalization program and supplying the necessary digital gargets and in capacity building one of the PEAs responded as follows.

"I am not sure how many organisations are part of the program, but they are many supporting it. But I can remember, VSO, Imagine World Wide,

One Billion, BEFIT and JBF including the Malawi government itself" (PEA 1).

From the above response, it can be seen that the program is well supported both from the government side and the Non-Governmental Organisations. It is further noted that the schools were provided with solar power electricity and in some cases, they facilitated the connection of electricity from country's grid. The information above corresponds to the current digital profile and policy documents as regards education that Malawi as a country has made headways in digitizing Malawian publications. In primary school, through BEFIT, it is noted that Malawi is one of the first nations to scale a digital personalized learning solution countrywide which targeted millions of Malawian children and created a benchmark for other countries to follow. The tablets work offline and off-grid as they are solar charged.

The current status of education digitization especially in lower primary schools is a departure from earlier reports especially of 2007 which bemoaned the countries failure to improve its status. The report stated that there were few noteworthy initiatives in the country to bridge the digital divide as many of the initiatives depended on donor funding like the world Bank, Department of International Development(DFID), the Japanese International Co-operation (JICA) and Swedish International Development Agency (SIDA) just to mention a few as observed from the current program under this study as it was noted that it is the BEFIT organisation that is providing tablets which are used in instruction in lower primary schools in most primary schools in Malawi including those under this study. However, it can also be seen that it is following the same old path

implementation where a lot of the initiatives are supported by NGOs and donors despite the government taking a coordinating role through BEFIT. In line with the theory of Reasoned Action it can be noted that the idea to digitalize education might have come due to the tenet of intention where society's aim of education is make students as global citizens where they are supposed to know the 21st century skills.

4.2. Exploring How Teachers Integrate Digital Technology in their Classroom Arena

4.2.1 Teachers' Understanding of Digital Technology

The purpose of integrating digital technology in the classroom situation is to improve teaching and learning and improve the learning outcomes at the end. However, if the teachers do not know how to fuse the technology in the learning situation, it would influence them to have a negative attitude to use the innovation as advocated by the Theory of Reasoned Action (TRA) hence, the learning outcome intended cannot be realized. It is for this reason that the researcher first wanted to find out if the teacher's and even the education advisors understood digital technology. Most respondents interviewed showed some kind of understanding as seen in the following excerpts in the table below.

Table 2: Teachers' Understanding of Digital Education

Respondent	Response
T3	*"....Knowledge of new skills using technology…computers"*
T5	*".....it's getting information through digital platforms"*
T9	*"...use of new technologies in education e.g., phones"*
T4	*"It's a way of learning using technology e.g., tablets"*

T8	*" it refers to the use of technology to support learning"*

From the above response, it can be observed that most teachers have the basic understanding of digital learning or digital education. However, most of them do not understand beyond the classroom situation as regards the outcomes which can be realized from the instruction that integrates the digital platforms after the learning situation. It is noted that, all teachers were trained in the use of tablets regardless of the class one is teaching as reiterated by both the PEAs, Head teachers, and teachers. The following excerpts from respondent 1 sums it all:

> *All teachers were trained for two days on how to use the tablets in the teaching and learning environment. And from our inspection we have seen progress and it has helped a lot (P1. 7/9/2024).*

The above response is in line with the theoretical framework guiding this study that if people are oriented on how to use technology, it is easy to embrace and use it without problems and is in agreement to what Firomumwe and Gamira (2021) stated that teachers find it easy to integrate and use technology stemming from their perceived usefulness and perceived ease of use.

4.2.2 Digital Content versus Curriculum Content

On the integration digital technology in the lesson, the researcher got mixed reactions with some teachers agreeing that they use the tablets in the actual learning situation, while some said that they use it as a separate subject on the timetable. For example, one of the respondents revealed the following:

"We have those subjects such as Agriculture, Mathematics, English just to mention a few, then we also have the time allocated on the school timetable where pupils use the tablets. In the other subjects on the timetable, we do not use the timetable. And for here on the timetable, we put BEFIT to signify that it is the time to use tablets…" (T6. 4/9/2024).

An observation in school BB it was noted that the sessions for the BEFIT programme was not even put on the master timetable but it had its own timetable as shown in the picture below:

Figure 2: showing learning sessions for the BEFIT programme for school DD

When asked whether the content in the tablets matches with what is in the curriculum, teachers interviewed agreed that they match. However, one respondent showed that there were some gaps. This is what she said:

> *"Of course, the content we can say is partially in line with the curriculum but only for Agriculture, English and Chichewa but for Mathematics it is not. Of course, may be its due to the change in the instruction books. At first the books matched with what is in the tablets, but now the ministry changed the mathematic books which has different content from what is in the tablets." (T3. 10/9/2024)*

When the researcher checked the content in the tablets, it was observed that there was less difference in the material the learners were presented. The only difference was that in the BEFIT programme, the learners interact with the digital content a lone through audial-visual lessons. The teacher just supervises and answers to questions from the learners if ones tablet is not functioning. The lessons automatically scales someone weather to proceed to the next stage or not. The caption below is part of the lessons the researcher took from the tablets for standard 1 lessons.

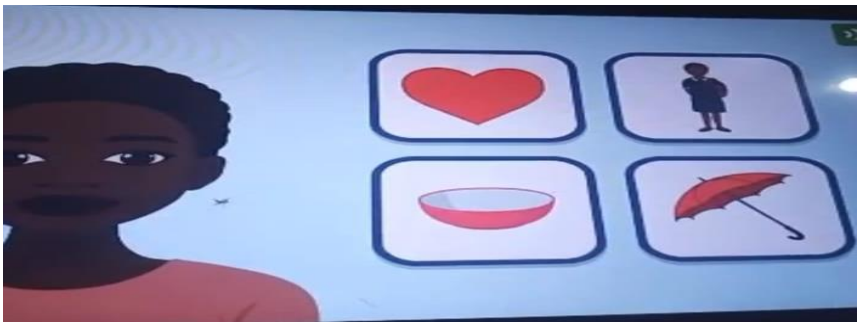

Figure 3: Lesson Caption from a tablet on literacy

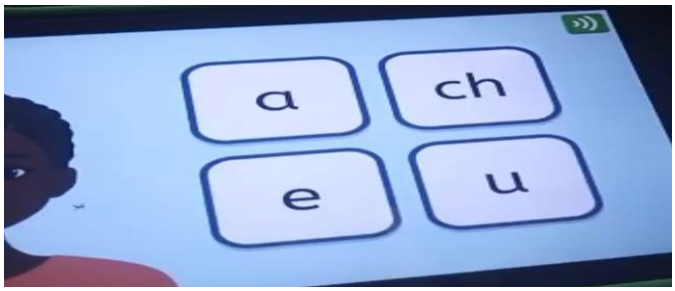

Figure 4: Screen-short of Lesson 2 on Chichewa

From the figures above, the learners are asked to identify the objects through the help of a cartoon as seen to the left side. After attempting successfully, the individual learner advances to another level.

From the lesson observation, it was noted that the teachers have less work as their role is just to supervise what the students are doing during the learning sessions. The students are self-assessed as they move from one stage to another after completing the task successfully. This is in line with what most participants alluded to that the use of digital platforms seem to simplify the teaching and learning process as most of the activities are done by the learners on their own through the audio-visual instructions.

However, the major difference was the initial target of the lessons in the tablets. As observed by the following excerpt from T10 it is argued that the lessons targeted numeracy and literacy skills:

"Through BEFIT, the ministry of education had target areas such as improving literacy and numeracy skills of all learners in standards 1-4.

The tablet learning is just an additional learning to the already existing curriculum." (T10. 8/9/2024)

As highlighted by respondent above and other a cross-sectional interviews, it can be concluded that the BEFIT is just working parallel with the current existing curriculum just to supplement the deficiencies of the curriculum. As seen from its content, there no major difference. The only difference is that the tablets provide video-visual material, while the other provide textual materials. As observed from the excerpt below of the content from standard 3 English book, the content between the two platforms are complementary to each other.

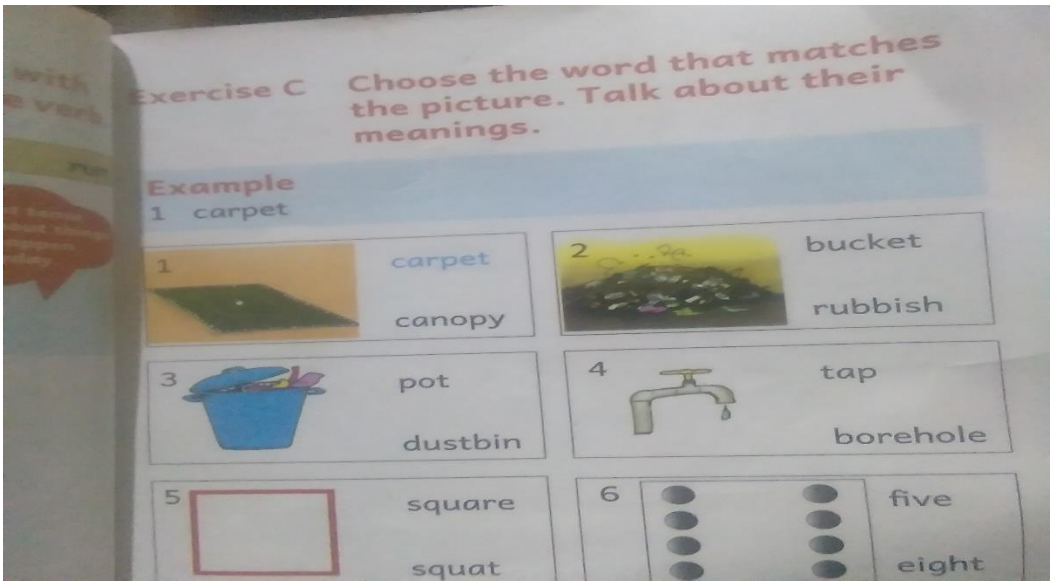

Figure 5: Exercise taken from standard 4 English book

The picture above taken from the textbook for standard 3 is similar to a picture in **figure 3 and 4** taken from a tablet though from a different class. However, as regards the issue of parallel curriculum, it is contended that this current implementation of this digital technology has the room to bring confusion as regards the outcomes of the initial curriculum as it acts as a reform on its own before the general curriculum review or reform. This is supported by Nevenglosky (2019),

who states that parallel programs brought sometimes by international agencies who are part of the partners in education, sometimes contributes barriers to effective curriculum implementation especially.

4.2.3 Learner engagement in the Teaching and Learning Arena

On his theme, the researcher got the responses from learners in standard 1-4 to appreciate their experiences with the new mode of learning through the tablets. Teachers who participated in this study also acknowledged that there was at least a shift in pedagogical approach- from teacher centered to learners centered as highlighted below by one teacher:

> *"Previously they were teacher centered while nowadays are learner centered…..learners are able to solve issues on their own and this minimizes teacher work load" (T7, 8/9/2024)*

It has also been observed that teachers could use the tablets to explore other learner centered techniques that provide a more engaging classroom situation. More is explained from the extract below from one of the teachers:

> *"Classroom activities are learner centered…..they learn various things like games, songs which makes learning interesting. It has also improved learner attendance as children now come to school willingly and has also improved their performance in other subjects like numeracy, reading." (T6. 10/9/2024)*

From the above excerpt it can be seen that the use of tablets as a learning tool has helped both the students, and teachers. Above all, it has also helped in administrative sense because students are motivated to come to school hence improvement in attendance rate. Students had their own experience to talk about the use of tablets learning is more engaging and interesting. The following excerpts highlight students' responses about their experience with the use of the tablets:

S1. We just follow instructions from the teacher

S2. It is really good. We use the finger to solve mathematics, and we enjoy the subject

S3. We are always busy listening to the teacher's instruction when learning and then we follow what the teacher has said

S4. I am always active in class….. The coming in of tablets has really helped me. Now I can read without problems

The above responses represent the majority of learners who felt excited with the use of tablets in the instruction process. In making the teaching and learning engaging, the data above correlates with different studies. For example, studies, such as that of Kane et al. (2002) asserts that teachers' use of technology in class helps the learners to get involved due to the motivation it brings. However, he also attributes to teacher's personal beliefs, perceptions, attitudes and orientations. Another belief factor that has also attracted the attention of scholars in analyzing why teachers integrate or not integrate technology in their lessons is the view that teachers have towards different teaching and learning practices and styles and pedagogy in addition to the needs, emotions,

motives, beliefs and attitudes of the teacher and that these practices when used positively, contribute to students' success (Fives and Gill, 2015). This is in line with the Technological Acceptance Model to the part of the teacher which then helps in channeling the same values and beliefs to the learners.

4.3 Challenges in implementing digital education on students' learning outcomes

Besides the many success stories told by the teachers and students about the benefits of using the digital gadgets in the teaching and learning process, there have been some challenges that have been noted by the teachers and some stakeholders in the implementation process of the BEFIT program. The following box provides an overview of what the responses the research got from the field of study:

T8. *"Damage of tablets, cables and headphones"*

T6. "Inadequate tablets, classrooms"

P1. "Lack of knowledge to maintain them/ damaged materials take time to be replaced"

T9. "They can also stop during the lesson time"

T4. "Some cables do not function properly that makes it had to stabilize noise"

T5. "Lack of knowledge on how to open some application" and it becomes time consuming"

P2. "Some subjects are not there"

P1. "They are not inclusive as there are no special headsets for those students with hearing impairment/ there is breakdown in communication"

It is worth noting that the above challenges can contribute to problems for the successful implementation of the program if not well dealt with in time. To start with, the issue of damaged tablets and their accessories can hinder the operations by learners which may lead to frustrations in the teaching and learning situation.

On the issue of inadequate resources, in this case tablets can be substantiated by the picture below that indicates a big challenge due to high enrolment ratio in the lower primary school or primary school in general due to free education policy.

Figure 6: Learners using Tablets during the Lesson

From the above picture it is seen that almost every learner has his or her own tablet. However, there are few schools which do not have enough tablets due to their high enrolment. Teacher planning can also be affected because there would be inadequate learning materials against the high enrolment ratio. As indicated also in the above excerpt, some teachers have less knowledge on the operation of the tablets and even their maintenance should they get damaged or have some technical faults. This problem can make the teacher to just revert to the old teaching pedagogy. This is in line with the Technological acceptance model which states that if the beneficially of

technology are not well informed about the operation of the technology, they are bound to reject its use (Fisher, et al. 2014).

Although, the BEFIT program had its initial target on numeracy and literacy skills, its contribution to the teaching and learning situation has aroused interest for the need to expand it to other subject areas. As already observed from the box above, teachers and PEAs wished if more subjects like agriculture were included in the tablets. This would in one way or the other try to address one of the challenges facing the integration of ICT in Malawi that was highlighted in the country report of 2007 in which it was discovered that there is still little content based on the local curriculum frameworks available in Malawi's education institutions (Isaacs, 2007).

It has also been noted that the lessons and the programs put in the tablets lack some elements of inclusivity. This, as highlighted, is due to the absence of hearing device for those with hearing impairment. This challenge can pose a threat to students learning outcomes especially those with an impairment. Some of the challenges observed in this study are among the cited contributions towards people's negative attitude to embrace technology in education as cited by Raja and Nagasubramani (2018), which included hardware failure, lack of enough resources, lack of expertise and lack of support.

The issue of lack of knowledge as reflected in what T5 highlighted has been the common challenge facing digital teaching and learning and it conquers with some studies which have also highlighted

technical difficulties, as a major problem in most schools and that it is a source of frustration for students and teachers and cause interruptions in teaching and learning process (Ghavifekr and Rosdy, 2015). Similar problems have been acknowledged in this study, which has been aggravated too, by lack of technical assistance in repairing the gargets, teachers who are not able to use them are discouraged from using computers because of fear of equipment failure.

4.4 Solutions to problems of integrating digital technology in classroom setting

When asked about the solutions to the problems incurred in the implementation of the digital technology in the classroom from the schools under this study, respondents highlighted the need for the following: Firstly, there was a need to conduct consistent trainings for all teachers on how to use the tablets so that they convey the correct information to the learners at the same time be able to operate the gadgets in the classroom arena. Secondary, it was noted that there was need for technicians to handle problems that the teachers and learners are facing, such as when the tablets stop working, or when the accessories are damages. For example, one of the respondents had this to say: "*We need more technicians so that it is easy to reinstall damaged materials*." As indicated in the statement, this would ensure smooth running of the program. This issue of having technicians, would also help to reduce the aggravation of the problem of in-adequate of the resources.

Secondly, from the management perspective, it would be important if PEAs, Head teachers and other stakeholders that are involved in the education system took an active role to scrutinize the type of content that is included in curriculums like the one under the this study. As argued by the TRA, it would be also good if they were even given the chance to choose what to be included as

this would translate into the right attitude towards the implementation of the program (Ramayah et al., 2003).

Lastly, to make sure that learners get the best from the technology it was suggested that more subjects are supposed to be introduced in the tablets. These include subjects like agriculture and other science subjects. The expansion from just numeracy and literacy skills would help the learners to have access to more information that would develop the required skills and values from other subjects. This at the end will ensure meaningful learning among learners at primary school.

4.5 Chapter Summary

The chapter has presented and discussed the findings of the study based on the objectives from which themes and sub-themes were generated. Major themes were generated from the objectives on assessment of the current status of digital education implementation in the selected primary schools, an exploration on how teachers integrate digital technology in their classroom arena identification of the challenges in implementing digital education on students' learning outcomes and lastly on the solutions to problems of integrating digital technology in classroom setting. From the discussion, literature was also engaged to understand similarities and differences in the findings of other studies on the similar topic of study. It is from this chapter that the conclusions and recommendations were drawn.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Chapter Overview

This chapter draws its conclusion and recommendations from the research findings and discussions. It presents the researcher's point of view in form of a conclusion of the study, provides recommendations and also the area of further study.

5.2 Conclusion

Technology has a positive impact in the education system. From what the researcher has found from this study it can be concluded that the current status of digital education in the country still need to be reinforced if the education system is to realize the intended digital outcomes. The fact that there is progress on resource support, a lot still need to be done to sustain the initiatives already introduced. The ministry of education and its stakeholders need to take affirmative action to make sure digital education is fully implemented so that citizens should not lag behind in this forth industrial revolution. Peas and other educational managers need to be empowered to make sure that they own these innovative programs that would help to address different society problems both at individual students' level and their community at large.

From the study, it has been observed that students' literacy skills and numeracy skills have improved significantly in comparison with the previous years before the introduction of the tablets. The other outcomes could not be concluded on because they were not the initial target of the program. Teachers and all relevant stakeholders responsible for promotion of education should take advantage of every opportunity arising in embracing the technological innovation in the

classroom situation to realize great outcomes that would make leaners survive in this 21st Century. The Challenges faced in the implementation of the BEFIT program should act as a platform for which good results can be achieved after addressing them. This requires team work at all levels of educational management.

Lastly, it would be important to consider involving the Malawi Institute of Education which is mandated in the development of a curriculum and curriculum resources for any new program that is introduced. This would easily help to align the new programs to the already implemented curriculum approaches. This also would help to reduce confusion, where a lot of different programs are introduced that later overloads the already existing curriculum.

5. 3 Recommendations

From the study finding the researcher proposes the following recommendations:

5.3. 1 Proper Coordination between Stakeholders in Curriculum implementation

There is need for proper coordination between different stakeholders in the provision of learning materials in schools that are supported by several organisations but are on the same project while leaving other schools with little or no support. On the same issue of coordination, the research recommends that there should be proper coordination between the Ministry of education and the Malawi Institute of Education bout the parallel programs that come between the curriculum implementation which sometimes bring confusion and a lot of multitasking that affect the successful implementation of the curriculum.

5.3.2 Proper Orientation Trainings and CPDs for Teachers

Teachers are the key in any implementation of an education process. It is therefore very important to provide enough resources to train them through Continuous Professional Development (CPD) before and during the actual implementation of any education program. This should include training teachers in technical skills which would help them deal with emerging technical problems arising during the teaching process

5.4 Areas of further Studies

1. The role of stakeholders in the curriculum implementation

Based on various studies, it has been noted that various stakeholders are involved in the development of any curriculum in Malawi. However, at the end of curriculum review the MIE and Ministry of Education take much of the blame in the failure of the curriculum to achieve its intended outcomes. Therefore, a study can be carried to explore the role of various stakeholders or partners in the development and implementation of a curriculum.

5.5 Chapter Summary

The chapter has presented the conclusion and recommendations the research suggested for programs which was under study. From the recommendations the researcher gives her input that would help the stakeholders in innovative program implementation to be successful.

References

Angrist, J. and Lavy, V. (2002). New evidence on classroom computers and pupil learning, *Economic Journal 112(482): 735–765.*

Bolton Ruth N., and Drew James H., (1991), "A Longitudinal Analysis of the Impact of Service Changes on Customer Attitudes*," Journal of Market. 55*

Bull, G. Thomson. (2016). Evaluating the impact of educational technology: *Journal of digital learning in teacher education 32(4),* (pp. 117-118).

Bulman, G. and Fairlie, R.W. (2016). *Technology and Education: Computers, Software, and the Internet*. Working Paper 22237.https://www.nber.org/papers/w22237

De Vries, S., & Roorda, G. (2016). A Reasoned Action Approach to Participation in Lesson Study. Paper presented at WALS 2016, Exeter, United Kingdom

doi: 10.1080121532974.2016.1217052.

Fink Arlene, (2003). *The Survey Handbook*. Thousand Oaks, CA: Sage Publications. https://www.jotamac.typepad.com

Fives, H. and Gill, M.G. (editors) (2015). *International Handbook of Research on Teacher's Beliefs*. New York: Routledge

Fraenkel, J.R., Wallen N.E., and Hyun, H. (2012). *How to Design and Evaluate Research in Education*. (8th edition). New York: McGraw Hill.

Ghavifekr, S, Razak A. Z., Ghani, M.F. Ran N., Meixi, Y and Tengyue, Z. (2012). ICT integration in Education: incorporation for teaching and learning improvement. *The Malaysian online Journal of Education Technology, Vol.2 issue 1*

Ghavifekr, S. and Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science (IJRES), 1(2), 175-191*.

Gama, L.C. Chipeta, G. and Chawinga, W. (2022). Electronic learning benefits and challenges in Malawi's higher education: A literature review. Education and information Technologies Vol 27(8):11201-11218. DOI:10.1007/s10639-022-11060-1

Ghavifekr, S., Kunjappan, T., Ramasamy, L., and Anthony, A. (2016) Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perception. *Malaysian online Journal of Education Technology, Vol.4 issue 2*

Hagger, M. S. (2019). *The reasoned action approach and the theories of reasoned action and planned behavior*. In D. S. Dunn (Ed.), Oxford Bibliographies in Psychology. Oxford University Press. doi: 10.1093/OBO/9780199828340- 0240

Haradhan, M. (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, Vol-7 Issue 01, pp. 23-4. https://mpra.ub.uni-muenchen.de/85654.

Hosseini, Z., Gharghani,Z.G., Mansoori, A. Aghamolaei, T. and Nasrabadi, M.M. (2015). Application of the theory of reasoned action to promoting breakfast consumption, *Medical Journal of the Islamic Republic of Iran (MJI.), Vol. 29* p.289. http://mjiri.iums.ac.ir

https://www.unicef.org/esa/media/10281/file/UNICEF-Malawi-2021-2022-Education-Budget-Brief.pdf Connectivism Learning Theory (wgu.edu).

Isaacs, S. (2007). *A Short Country Report Survey of ICT and Education in Africa: Malawi Country Report.*

Jacobsen M, Mazur, AD and Brown, B (2015). *Learning and Technology, 41(2), 1-26. http://files.erick.ed.gov/fulltext/ej1064818.*

Kayange, A.K.M.Y. (2019). E-learning encounters in Malawi higher education institutions. *International Jounal for e-Learning Security, Vol. 8(1)*

Kane, R., Sanretto, S. and Health, C. (2002). *Telling half-truth: a critical review of research on the teaching beliefs and practices of university academics*. Review of Educational Research, Vol. 72(2), p. 177

Klopper H. (2008). *The qualitative research proposal. Curationis.North-West University*. South Africa.

Luik, P. and Taimalu, M. (2021). *Predicting the intention to use technology in education*: a path analysis Educ.sc. 11, 564. https://doi.org/10.3390/edsc11090564.

Majid M.A.A, Othman M, Mohamad S.F. and Lim, S. (2017). Piloting for Interviews in Qualitative Research: Operationalization and Lessons Learnt. *International Journal of Academic Research in Business and Social Sciences 2017, Vol. 7 No. 4*

Maxwell, J.A. (2012). *Qualitative research design: An interactive approach* https://www.researchgate.net/publication/320353627.

Menon, K. and Castrilon, G. (2019). Reimangining Curricula for the fourth Industrial revolution. *Independent Journal for Teaching and learning, Vol. 14(2). P. 7-14*

Montano, D.E. and Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. htpps://www.researchgate.net/publication/282778339.

Nasibi M.W. (2015). A critical appraisal of history taught in secondary schools in Kenya. *International Journal of Academic Research in Progressive Education and Development Vol. 4 No. 1* pp. 2226-6348. *http://dx.doi.org*.

National planning Commission (2020). *Malawi's Vision: An Inclusively Wealthy and Self-reliant Nation. Malawi Agenda 2063*. Lilongwe

Neuman W.L. (2014). *Social Research Methods: Qualitative and Quantitative approaches*. (7th edition). Harlow: Pearson Educational Ltd. www.pearsoned.co.uk.

Noyes S.J. and Teo T. (2014). *Explaining the intention to use technology among pre service teachers: A multi group analysis of the unified theory of acceptance use of technology. Interactive learning environments, 22*

Osika, E.R., Johnson, R.Y. and Buteau R (2009). Factors influencing faculty use of technology in online instruction: A case study. *Online Journal of Distance learning Administration, Vol. 12(1)*

Paimin A, N., Prpic, J.K, Hadgrft, R. and Alias, M. (2016). Application of the theory of reasoned action: assessing success factors of engineering students. *International Journal of Engineering Students, vol. 32(6)*. Pp.2426-2433

Raja, R. and Nagasubramani, P.C. (2018). *Impact of modern technology in education. Journal of Applied and advanced Research*, Vol 3(1). https://dx.doi.org/10.21/jaar.2018.v3s1.165. P

Ramayah, T. Nasurdin A.M., Noor M.N.M., and Hassan, H. (2003). Students's choice intention of a higher learning institution: An application of the Theory of Reasoned Action (TRA). *Malaysian Management Journal, Vol.7(1),* P. 47-62.

Schwab, K. (2016). The Fourth Industrial Revolution: What it means and how to respond. http://www.weforum.org/agenda/2016/01the-fourth-industria-revolution-what-it-means-and-how-respond.

Trafimow, D. (2009) The Theory of reasoned action. *Theory and Psychology, Vol. 19(4).* Pp.501-518. Doi: 10.1177/0959354309336319

Vankatesh and Davis (2003). *"Perceived usefulness, perceived ease of use and user acceptance of information technology*, Vol. 13(3). doi:10.2307/249008JSTOR,s2CID1234

Vernnette, L.A. and Hetcher, R.P (2013). *Technology integration classrooms: An analysis of barriers and implications*. Themes in science and Technology education, 6 (2), 73-90

World Development Report (2018). *Learning to realise education's promise* (Flogship report): World Bank. https//www.worldbank.org/en/publication

APPENDICES

Appendix 1: Consent Form for Participants

.

Dear Sir/Madam,

My name is **Faith Nyirenda** a postgraduate student at Mzuzu University. I am pursuing a Master of Education in Leadership and Management. I am carrying out a study on **Exploring the extent to which digital assisted learning contributes to primary school learning outcomes as a partial fulfillment of the requirements of the award of the Master's Degree**. Information you give in this study will be treated with utmost confidentiality and will not be accessible to any person except my supervisors and me. Information you give will be used for academic purposes only.

Participation in this study is voluntary. For this reason, upon accepting to take part in this study, you are requested to sign in the spaces provided below.

Name: _____ Signature: _____ Date: _____

Appendix 2: Interview Guide for Teachers

1. What is your understanding of digital education?

1. What classroom pedagogical practices changed with the review of the primary curriculum?

2. How do you integrate technology in your primary lessons?

3. What impact has the tablets on you as a teacher and the students?

4. What is the advantage of the virtual/ e-learning instruction in comparison with the previous curriculum approach?

5. What challenges have been faced in the implementation of the use of tablets approach in learning?

Appendix 3. Interview Guide for PEAs

1. What is your understanding of virtual / e Learning approach to instruction?
2. What need was there to introduce review/change the virtual curriculum approach of use of books approach?
3. What is the link between the current virtual curriculum by use of tablets approach to the achievement of outcomes of the curriculum in Malawi?
4. What has been your role in facilitating the implementation of the current virtual curriculum?
5. What challenges do teachers face in implementation of the current primary curriculum by use of tablets?
6. What measures are put in place to mitigate challenges in the implementation process of the curriculum?
7. What do you think can be done to improve primary school teaching and learning to meet both curricular and goals of using technology in primary science education in Malawi?

Appendix 4. Interview Guide for Students

1. How engaged are you during the teaching and learning by using the tablets?
2. What has been your experience since you started learning at primary school without use of tablets?
3. What does the teacher do to make the subject more appealing and easier to understand?
4. In what way would you apply what you learn from primary science classroom?

Appendix 5. Classroom Observation Checklist

SCHOOL NUMBER: _____ DATE: _____

OBSERVERS'NAME:_____ CLASS: _____

A	OUTCOMES FOR STUDENTS			
1	Learning in Lessons	YES	NO	REMARKS
	➢ are able to solve problems working in small groups and on their own;			
	➢ are enthusiastic;			
	➢ enjoy being given challenging tasks			
	➢ understand how well they are doing and what they need to do to improve;			
2	Students' outcomes in the curriculum			
	➢ Most students achieve the learning outcomes set down in national curriculum guidelines and in the syllabus for their stage in learning			
5	➢ Students' behaviors and involvement in school life			
	➢ show respect for the rights of other people;			

	➢ are making very good progress towards developing the social skills and attitudes which they will need as good citizens, parents and workers.			
B	THE TEACHING PROCESS			
1	A curriculum which is appropriate and relevant	YES	NO	REMARKS
	➢ reflects the national priorities outlined in the Education Act 2013 and takes account of cultural context and students' educational needs			
	➢ develops active participation by all students and encourages them to think for themselves;			
	➢ Students are exposed to multiple perspectives			
2	Teachers with good professional, subject and curriculum knowledge			
	➢ are aware of developments in their subject and curriculum areas;			

	➢ are interested in learning, continue to develop their own knowledge, understanding and skills and encourage their students to value learning;			
	➢ reflect on and, in staff meetings, discuss the most effective ways of helping children to learn;			
3	Well planned lessons			
	➢ Teachers plan for a range of teaching methods as appropriate to the topic, the focus of individual lessons, the classroom environment and students' needs			
	➢ Teachers can explain why they have selected specific digital teaching resources.			
4	Teaching for effective learning			
	➢ adjust their teaching methods to class size, facilities available, what students need to learn and how well they understand			

	➢ encourage students to think for themselves;			
	➢ Engages students in authentic, real world experience			
	➢ learning is contextualized			

APPENDIX 6: A LETTER TO THE DISTRICT EDUCATION MANAGER (DEM)

Mzuzu University,

Private Bag 201,

Luwinga,

MZUZU 2.

Email: Faith_Nyirenda@wvi.org

The District Education Manager,

Post Office Box 13,

Nkhata bay.

Dear Sir,

REQUEST TO CARRY OUT A RESEARCH IN YOUR SCHOOLS

I am a post graduate student at Mzuzu University pursuing **a Master of Education in Leadership and Management**. I am carrying out a study titled *"Exploring the extent to which digital assisted learning contributes to primary school learning outcomes",* as a partial fulfillment of the requirements for the award of a Degree of Master of Education. I am therefore writing to request your good office for permission to carry out this study in few selected primary schools in your division That are in BEFIT program.

Yours Sincerely,

Faith Nyirenda.

APPENDIX 7: LETTER TO THE HEADTEACHERS OF THE SELECTED SCHOOLS

Mzuzu University,

Private Bag 201,

Luwinga,

MZUZU 2.

Email: Faith_Nyirenda@wvi.org

The Headteacher,

_____

Dear Sir/ Madam,

REQUEST TO CARRY OUT A RESEARCH AT YOUR SCHOOL

I am a post graduate student at Mzuzu University pursuing a Master of Education in Leadership and Management. I am carrying out a study titled*"* as a partial fulfillment of the requirements for the award of the Degree of Master of Education. My study will involve focus group discussion with the respective teachers. I will also request to have a face to face interview with you which is related to the topic of my study. I intend to protect the anonymity of your institution, of the teachers and yourself by using pseudonyms.

I am therefore writing to request for permission to carry out this study at your institution.

Attached is an introduction letter from Mzuzu University.

Yours Sincerely,

Faith Nyirenda

APPENDIX 8: CONSENT FORM FOR AUDIO-RECORDING INTERVIEWS

I invite you to participate in an interview in my study on the topic *Exploring the extent to which digital assisted learning contributes to primary school learning outcomes* I would like to audio record what transpires in this interviews. I therefore, request for your permission for me to audio record our discussions in the interviews. Please sign below if you have accepted to be audio-recorded. I give consent to the following:

a) Being interviewed in the study.

b) Being audio-recorded during the interview.

Name of the teacher: _____

Signature of the teacher _____ **Date:** _____

Name of the Researcher: _____

Signature of the Researcher _____ **Date:** _____