The implementation of Building Education Foundations through Innovation and Technology: A case of selected schools in Nkhotakota District

By

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DECLARATION

Declaration by the Candidate:

I hereby declare that this thesis is my original work and has not been presented for a degree In any other University. No part of this thesis may be reproduced without the prior written Permission of the author and/or Mzuzu University.

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Declaration by the Supervisor:

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DEDICATIONS

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ABSTRACT

Education Technology plays a critical role in enhancing literacy and numeracy in primary education. In Malawi, the Building Education Foundations through Innovation and Technology (BEFIT) initiative aims to address these needs by improving educational practices in primary schools. This study sought to investigate the factors influencing the adoption and implementation of BEFIT in Malawian primary schools, with a particular focus on understanding how head teachers are implementing this initiative.

The study followed a qualitative research approach, utilizing the interpretivist paradigm to explore the experiences of school leaders and other stakeholders. A case study design was employed to gather firsthand data from two primary schools in Nkhotakota District where the BEFIT project is being piloted. Participants included head teachers and other stakeholders

Data collection methods comprised face-to-face interviews, focus group discussions, and observations. Findings revealed that several challenges hinder the successful implementation of the BEFIT program, including limited resource, high dropout rates and high proportion of unqualified teachers. Additionally, failure to carefully incorporate learners with disabilities, were identified as significant obstacles. However, head teachers employed various strategies to overcome these challenges, such as fostering a collaborative environment among staff and engaging all stakeholders in the process.

The study recommends that the government should intervene by formulating policies that support inclusive education and infrastructure development, as well as provide adequate funding. Furthermore, BEFIT should expand its training programs to ensure all stakeholders are well-equipped to support the initiative.

Key words: educational technology, digital classroom, personalized learning, universal education, BEFIT, technological tools, management, evaluation, supervision, implementation.

ABBREVIATIONS AND ACRONYMS

SSA	Sub- Saharan African
EFA	Education for All
MOE	Ministry of Education
UPE	Universal Primary Education
EdTech	Education Technology
IRI	Interactive Radio Instruction
USAID	United States Agency for Internal Development
HRMT	Human Relations Management Theory
CME	Countenance Model of Evaluation
CIPP	Context, Input, Process and Product
EDC	Education Development Centre
MCDE	Malawi Collage of Distance Education
UT	Unlocking Talent
BEFIT	Building Education Foundations through Innovation and Technology
FPE	Free Primary Education
UNICEF	United Nation Children Education
CEED	Central Eastern Division

PTA Parents Teachers Association

VSO Voluntary Service Overseas

OPERATIONAL DEFINITIONS OF TERMS

Gender learning gap is the disparity in educational attainment between boys and girls in an educational environment (Evans *et al*, 2020).

Personalized learning: is a learner-centered teaching method approach in education system with the usage of digital tools in educational environment (Schmid *et al*, 2023).

Supplemental instruction: is an academic support that uses peer learning to improve learner's success (Paloyo, 2016).

Educational technology: Educational Technology to computers and other new electronic technologies that, when applied to educational settings, can significantly change education (Zufar, 2021).

Digital classroom: is a classroom with digital resources such as computers, laptops, tablets, or iPads that help teaching and learning to be effective (Gibson, 2022).

Educational problems: means challenges that are no less than minimum level of rigour and difficulty reasonably expected of the higher education course, in the context of the subject matter and level of the course (Kharkiv, 2023).

Sustainable development: the development that meets the needs of the present, without compromising the ability of future generation to meet their own needs.

Universal Education: the ability of all people to have equal opportunity in education, regardless of their social class, race, gender, sexuality, ethnic background, or physical and mental disabilities (Doughty, 2020).

Digital culture: is a workplace shaped and influenced by digital tools and technologies.

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CHAPTER 1: INTRODUCTION

1.0 Chapter overview

This chapter presents an overview of the entire thesis. It provides a discussion on the background, the problem statement, purpose of the study and the research objectives. It also presents the significance of the study and its limitations. The chapter also provides an outline of the research study.

1.1 Background

The majority of Sub Saharan African (SSA) countries adopted the Global Education for All (EFA) also called Universal Primary Education (UPE) policy in the 1990s with the aim of getting all eligible school going children enrolled in primary education, (Nyirenda, 2021). Then, Malawi was one of the first countries in Sub-Saharan Africa to take a bold step and adopted a policy on Free Primary Education (FPE) in 1994, (United Nations, 2015). Since then, Malawi has been facing challenges in the education sector such as overcrowding in classrooms, shortage of trained teachers and shortage of teaching and learning materials. As a result, there is poor quality in literacy and numeracy skills of primary school learners, (World Development Report, 2018).

To curb these ongoing challenges, the Ministry of Education (MoE) collaborated with different stakeholders to adopt the use of Educational Technology (EdTech) to improve the fundamental literacy and numeracy skills. Currently, the MoE is set to implementing the Building Education Foundations through Innovation and Technology (BEFIT) project in all the 6000 public primary schools. The main objective of adopting BEFIT is to deliver quality education because the government acknowledges that basic education is an essential requirement for sustainable development, (Nyirenda, 2021).

Educational Technology is referred to as a family of technological tools mostly based on computer technology devoted to promoting more engaging, interactive, and individualized learning experiences and other new electronic technologies that, when applied to educational settings, can significantly change education and improve learning experiences (Zufar, 2021; Lazaro, 2020; Strauss, 2013). It is a digital classroom resource that has potential to enhance learning. It has an arable field that has a significant role in facilitating learning to solve educational problems (Hung *et al*, 2019).

The first Education Technology project to be implemented in Malawi is known as Tikwere Interactive Radio Instruction (IRI) which was introduced in 2007 (USAID, 2015; UNICEF, 2017) Tikwere means "Let Us Rise". The aim of this project was to improve teaching and learning through 30 minutes "programs which are still broadcasting in different radio stations. It is designed to reinforce instructional strategies that emphasize student-centered approaches, active learning, and equitable classroom management for Standard 1-4 nationwide. They broadcast using local language (Chichewa) for standards one, two and three learners. IRI was funded by United States Agency for International Development (USAID) and implemented under a cooperative agreement with Education Development Center (EDC), who partnered with the Malawi College of Distance Education (MCDE), (Method, 2014).

The second intervention is Unlocking Talent (UT). The Ministry of Education (MoE), Voluntary Service Overseas (VSO) Malawi, One billion and Imagine Worldwide have been implementing the UT project since 2014. UT has provided One billion's comprehensive numeracy and literacy software on tablets to standard two learners. The aim was to reduce the gender learning gap that typically emerges at the primary school level particularly in Mathematics, (Malawi Brief, 2021-

2022). Children learn at their own pace in Chichewa using tablets that can be used offline and are powered by solar energy.

Lastly, the current intervention is the Building Education Foundations through Innovation and Technology (BEFIT), this project will run from 2020 to 2030 which provides tablets to learners. It has the same goal to improve learners learning outcomes in literacy and numeracy through supplemental use of individualized, self-paced instruction delivered through a specialized App on tablets in standard one to four in public schools, (World Development Report, 2018). This program is school-based and is designed to be integrated into the regular teaching structure and timetables within the school as supplemental instruction. The teacher moves around the classroom and provides help to individual students as needed. Each session lasts approximately 30-40 minutes, covering both literacy and numeracy, and then tablets are collected and taken to another class for their turn. Each tablet is used by 4-5 children per day, (BEFIT Report, 2022).

1.2 Statement of the Problem

Previously, the government established different innovations such as Tikwere Radio and Unlocking Talents Programs to initiate high quality results in education. The innovations were using technological tools as BEFIT but failed to achieve their intended goals of providing quality education to basic schools. They faced obstacles which led to the state of not achieving the objectives of the goals.

The first hindrance is some educators are digital immigrants because they were born before the widespread development and use of technology. Hence, they resist to adapt to the environment of the new technological era. Vermette (2013) explains that lack of knowledge, experience, organization support and time determine how people would use and accept technology during

instruction periods. Learners depend on educators to impart them with knowledge, but it is currently not easy to do so in Malawian public primary schools because teachers have negative attitudes towards technology.

Another problem was learning tools inadequate as in Tikwere session, teachers were using one radio against the large class, it was difficult to impart the knowledge to learners effectively. Learners negative attitude also become an obstacle to previous technological tools. Due to the rapid changes in the use of technology, it was necessary for school leaders to develop their digital literacy skills and put forward innovative applications for the safe and appropriate use of technology, (Baydar, 2022). Nowadays, leaders have become agents of digital culture who try to create a digital era often with limited time and resources but with the need to act efficiently in the face of changing global standards, (Johari et al, 2023). According to Bull (2016), educators in public schools are currently expected to use more technology in the literacy and numeracy classroom. Johari et al (2023

Despite the government's effort to achieve quality and relevance in education, Malawi still faces poor quality results in literacy and numeracy. Currently, it launched BEFIT program in striving to achieve the quality and relevance in education despite the failure of numerus previous innovations. From my personal observation, this program has brought extra baggage to school head teachers and teachers who already have workload which need appraisals. Therefore, leaders and stakeholders have responsibilities to manage the implementation of BEFIT programs in public primary schools to have effective results. Academically, so far, little is known about the implementation of BEFIT program. Therefore, this research intends to investigate how primary school head teachers and other stakeholders are implementing the BEFIT program. In addition, there is little knowledge or published studies in this area in Malawi to inform on strategies to use

on the implementation of the use of tablets in teaching numeracy and literacy in schools. This study, therefore, was intended to fill this gap by investigating how tablets are being used and could be used for numeracy and literacy teaching in Malawian public primary schools. It is an eye opener to school's stakeholders on how they can create effective strategies on this innovation hence is still on implementation stage.

1.3 Purpose of the study

The aim of the study was to investigate the adoption and implementation of the Building Education Foundations through Innovation and Technology (BEFIT) in public schools in Malawi**.**

1.4 Specific objectives

The study used the following specific research objectives to achieve its aim to:

a. To identify factors leading to the implementation of BEFIT in primary schools.
b. To examine challenges faced by the headteachers and other stakeholders in implementing BEFIT.
c. To explore strategies used by school stakeholders to promote BEFIT implementation

1.5 Significance of the study

The findings of the study have a potential to help the head teachers to have an in-depth understanding of the concept of Educational Technology in school settings. It is anticipated that this understanding will reveal some of the benefits of EdTech and challenges faced by the head teachers. The study will also assist head teachers to adopt developmental strategies that will help them to provide adequate formula to implement the usage of EdTech. In addition, the study will help the MoE and other stakeholders with the basis for formulating measures, improvement, and implementation of EdTech in schools.

1.6 Theoretical framework

Theoretical framework is the foundation from which knowledge is constructed (metaphorically and literally) for a research study, (Grant and Osanioo, 2014). It provides a grounding base, or an anchor, for the literature review, and most importantly, the methods and analysis. This study will be guided by two theoretical frameworks related to school management. The Human Relations Management Theory (HRMT) and the Countenance Model of Evaluation.

The HRM theory was originated between 1924 and 1932 during experiment conducted at the Hawthorne plant of the Western Electric Company in Cicero, Illinois (Baker Library, 2019). It was conducted by scholars from the Massachusett Institute of Technology (MIT), but Elton Mayo and Fritz J. Roethlisberger of Harvard Business School became involved in 1927 and eventually popularised the subject (Black and Bright, 2019). According to Mayo (1933), the research was designed to test the effect of lighting intensity on worker productivity, and the influence of human relations on work behaviour.

Elton Mayo's theory of motivation was not developed for educational areas but was propounded for the industrial area. However, it does not mean that it is impossible to make use of his theoretical concepts in educational management. In adaptation of this theory in educational settings, therefore, it concerns with quality of results if the head teachers and stakeholders are committed to the concepts of HRM.

The fundamental principle of HRMT suggests that employee productivity and motivation can be increased through positive social bonds in the workplace and acknowledgement of the worker as a unique individual (Black and Bright, 2019). This theory argues that improved working conditions such as empowerment, positive treatment, effective conditions, and participation of the employees

can lead to increased productivity. This implies that, only improved working conditions influence high productivity while unimproved working conditions influence the low productivity at work. Hawthorne experiment carried out by Elton Mayo had the following features.

1.6. 1 Treat employees well as individuals

Bright and Cortes (2019) stipulates that, a large portion of employee motivation comes from each person as an individual. Everyone's motivation is influenced by their unique personality, experiences, capabilities, circumstances, thoughts, behaviours, and other factors. As such, a key principle of HRMT is for the organizations to consider individual factors and how they can be influenced to increase motivation. This can include initiatives that look to change or improve an employee's personal circumstance in and outside the workplace as well as their personal desires, perceptions, and attitude (Bratton and Gold, 2020).

1.6. 2 Promote positive group values.

Cooperation among the workers should foster or promoted by the management, when the workers work in harmony and not in discord, it can lead to higher productivity. According to Gitman et al (2018), the theory increases the knowledge of the importance of informal groups and social relations in the workplace. The groups arise as people associate with one another. These informal group, at a certain extent adopt some characteristics such as, standards or behaviour, pressures to conform, informal leadership and status systems, just to mention a few. Since, individuals have social needs and interact together in the workplace, group factors must also play a role in employee motivation. HRMT have a key principle that, an organisation must promote positive group values and relationships so that social pressure will produce teamwork and positive employee attitudes and behaviours hence, group productivity (Bright and Cortes, 2019).

1.6.3 Ensure effective communication.

The effective HRHT is hinged on the understanding of and ability to manage the motivational issues to use them as out of workers (Akinsanya and Oludeyi, 2020). Communication is a process whereby people are linked and influenced to achieve a common and desired purpose. To promote productivity, managers need to share necessary information to his or her subordinates. Sharing necessary information for action is a two-way process and a powerful tool for the leaders who have developing and sustaining a smoothly functioning work team. Naturally, workers as rational human beings wish to know what happens around them, and the information they receive goes a long way to affect how well they are managed hence continually looking for information (Omolawal, 2016).

1.6.4 Effective supervision

According to Mayo (1933), many worker's behaviors, attitudes and emotions have their genesis in their supervisor's actions. Many workers do not like the strict and too much control supervision, but most admire the democratic or participative approach. This approach helps leaders or supervisors to:

1. Empower employees and allow for some degree of autonomy or control.
2. Understand employees‟ psychology which include motivation and behaviour.
3. Give positive feedback to the employees.
4. Communicate positively.
5. be sensitive to workers‟ individual and group needs.

1.6.5 Develop good working conditions.

The organizations must create good working environment with favorable, conditions that allow workers motivation towards their job. Workers are likely to sabotage their performance when they see that managers or supervisors are oppressing them (Spielman, 2020). Therefore, organizational leaders must ensure that:

1. Physical working conditions are safe and conducive to employee performance.
2. Social and other related working conditions promote employee productivity.
3. Workers‟ compensation and benefits are appropriate and effective.
4. input from leaders, supervisors and employees is incorporated into the Organization's policies and procedures.
5. All parties‟ interests on the working zone are aligned.
6. Social and other related working conditions promote employee productivity.

According to Hawthorne experiments results, the organization is likely to achieve the intended goals of the company, loyalty, discouraging high employee turnover and unionization and presenting a good face to the public, if the organization can apply the HRMT‟s key principles.

Ikwuka, (2016) states that, there is much competitive advantage achievable through employees. According to him, some of the reasons for maintaining effective HRMT in working areas include:

1. The theory, fuels commitment from workers to the success of the organization through their performance
2. It provides opportunities for workers to utilize their full potential and capacity.

3. It enhances management's ability to achieve organizational objectives through the labour force.
4. It encourages the willingness to operate flexibly in the organization's overall interest and the pursuit of a culture of excellence.
5. It establishes an environment needed to unleash the potentials and energy of employees.
6. It creates the conditions and environment where innovation, teamwork and total quality can be guaranteed.

The Mayo's theory, indicated that, leaders must provide direction, guidance, advice and structured environment to the workers. In other ways, the leader needs to supervise the organization with much effort. Supervision is generally viewed as an oversight function, where one is responsible for evaluating the performance of a subordinates. Stark and Jimerson, (2017) stipulates that, the head teachers are supposed to supervise and guide teachers because they are in the best position to make decisions that directly affect students' well-being and achievement. Adu, Akinloye and Olaoye (2014) intimates that, supervision (whether internal or external) should be considered a deliberate effort aimed at enhancing the outcomes of each educational institution and the supervision has a lot of responsibilities at a school environment as follows:

1. it encourages the interpersonal contact with workers. Face to face conversation helps leaders and teachers to work out things that could hinder the development of school.
2. It helps to create good relationship between the workers and leaders which promote the productivity in school organization.
3. It also provides the teachers as they became afraid that the managers must write a report if their leader found out that there is a misconduct.

4. It helps in improving performance in the sense that teachers work room hard in class to curb the challenge of low numeracy and literacy.
5. Supervision led to motivation. It might be positive or negative. Positive motivation arouse interest in teaching because of the rewards given. Similarly, negative motivation influences hard working spirit through the negative rewards which are meant to stop bad behaviour of workers.
6. It also promotes group unity during group discussion. Normally, after supervision, the leader organizes the subordinates to investigate the strengths, weaknesses, and the way forward.
7. The leader must be able to give feedback after supervising the work of the subordinates and helps leaders to provide training to the workers to fill the gap.

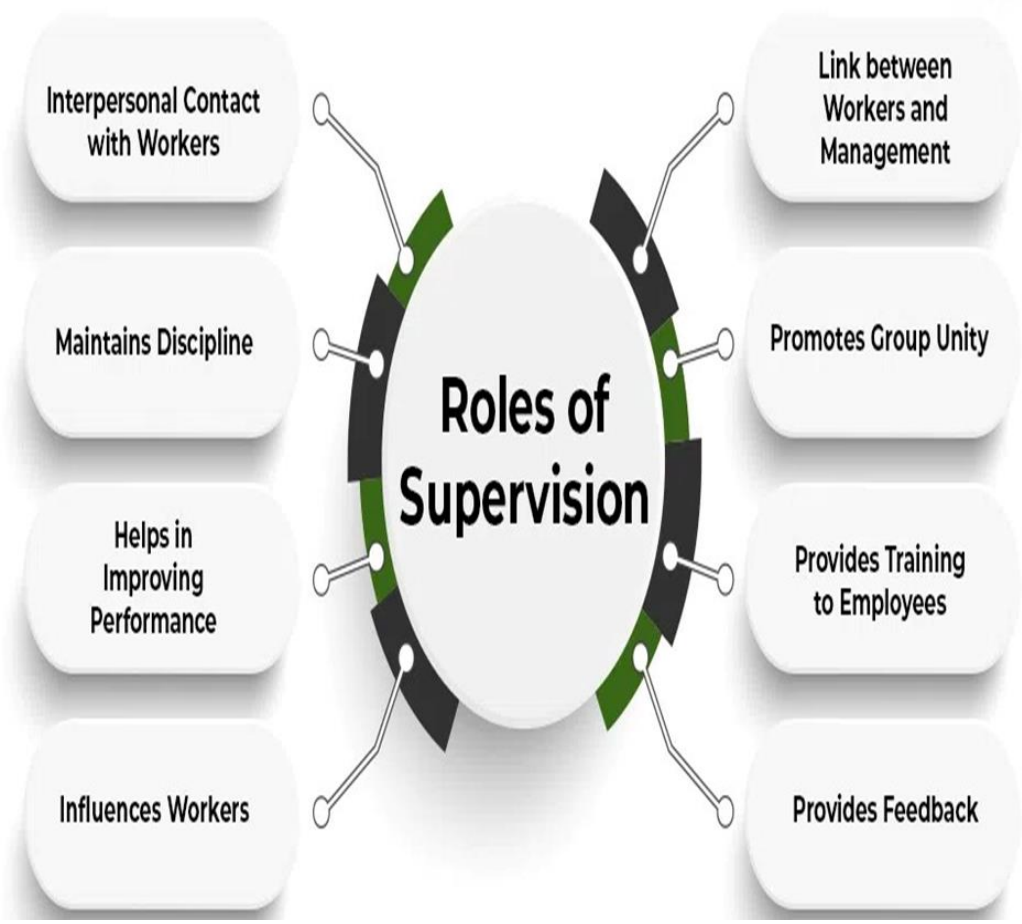

Figure 1: showing the roles of supervision in schools.

A figure above, illustrates that supervision by the head teachers have great roles that will provide the influence of promoting the high levels of numeracy and literacy in schools in the sense that, one of its roles is to influence teachers in the use of tablets in classrooms which promotes the performance of learners. The usage of Education Technology on basic education to achieve the educational goals of improving equity and quality education. It is shown that if the school leader supervises the work, he or she can promote the interpersonal contacts with workers, increase performance, promote group unity and it encourages to give feedback to worker. According to Dininni (2017), the Human Relations Management Theory has a landmark contribution to the

evolution of administrative thought because its significance lies in discovering and emphasizing the informal organizations, and facilitates teamwork and collaborations.

1.7 Supporting theory

The HRMT theory supported by Countenance Model of Evaluation (CME). The model is responsible in comparing the objective and what is in the ground. It was introduced by Robert Stake in 1967 for educational evaluation. He was emergent school of evaluator which calls for pluralistic, flexible, interactive, holistic, subjective, and service-oriented approach. The approach was built on Tyler's notion that evaluators should compare intended the observed outcomes, but also broadened the concept of evaluation by calling for examination of background, process, standards, and judgement as well as outcomes of the program.

Robert Stake's the countenance model of evaluation in education is an important aspect of program development to come up with improvement plan to achieve competitiveness, depending on the judgement of the one who evaluates. It is considered a decision-oriented model that systematically collects information about a program to identify strengths and limitations in content or delivery, to improve program effectiveness or plan for the future of a program. A model focuses on management-oriented evaluation.

The heart of this model is on the decisions that are come up with during the evaluation. There are three important phases of program development where this model revolves as antecedent, transaction and outcome. Ariah *et al.*, (2018) agrees that countenance is an evaluation model consisting of three phases of evaluation including antecedents, transactions, and outcomes. The stages are concentrating on planning, implementation and evaluation and are discuss as follows.

Evaluation model uses a stake evaluation model (Countenance Model). Evaluation of the learning plan or preparation (antecedent) is a learning undertaken by teachers and students is the early stage that describes the condition of learning. Evaluation of the learning plan in this study includes several indicators, namely:

1 input evaluation (antecedents), this stage has the overall goals or mission of the projector program. In this stage, planning is involved. The school leader has a capacity to look at the plans on how to handle human and material resources. For instance, he or she should look for the following things.

a. Plan on organizing learning resources. For instance, checking if tablets are enough for the learning process of education technology in the BEFIT program

b. Guidelines of methods to be followed.

c. Timeframe for implementing the use of tablets.

d. Plan of classroom management. On this stage, allocation of teachers must be considered to align with the plan of the project.

e. Plan the management of learning activities Plan learning achievement assessment

f. Learning activity is the implementation of lesson plans that have been prepared.

g. the learning activities is a process containing a series of activities of teachers and learners.

2. Process evaluation (transactions): in this stage, the leader focuses on the activities or components of the project. A leader focuses on evaluating the learning process. The

following are some things that must be assessed to help the stage.

a. Looks if the learners are using the tablets as intended.

b. Looks for punctuality; must check if all learners come back from break.

c. Looks if teachers are available for lessons.

d. Using the strategies and methods of learning

e. Knowing mastery learning materials

f. Use of resources or instructional media

g. Manages classrooms and Provision of duty.

h. Giving Provision of feedback

3. Outcomes evaluation (output): in this stage, the model evaluates the results shown on the project as impact, effectiveness, sustainability, and adjustment. The evaluation model consists of core values of evaluation as context, input, process, and product. The following figure of evaluation model, therefore, illustrates how evaluation model works to promote productivity in school organizations.

In addition to the Countenance model, the study adopted the Context, Inputs, Process and Product (CIPP) model as postulated by Stufflebeam. In 1971, Stufflebeam developed what was called the Context, Inputs, Process and Product (CIPP) evaluation model. He argues that the model's key emphasis is on decision-making. Stufflebeam viewed evaluation as the process of delineating information, then obtaining that information and interpreting it in such a way that the decision maker can best put it to use. Stufflebeam developed four components to evaluation which are shown in diagram below:

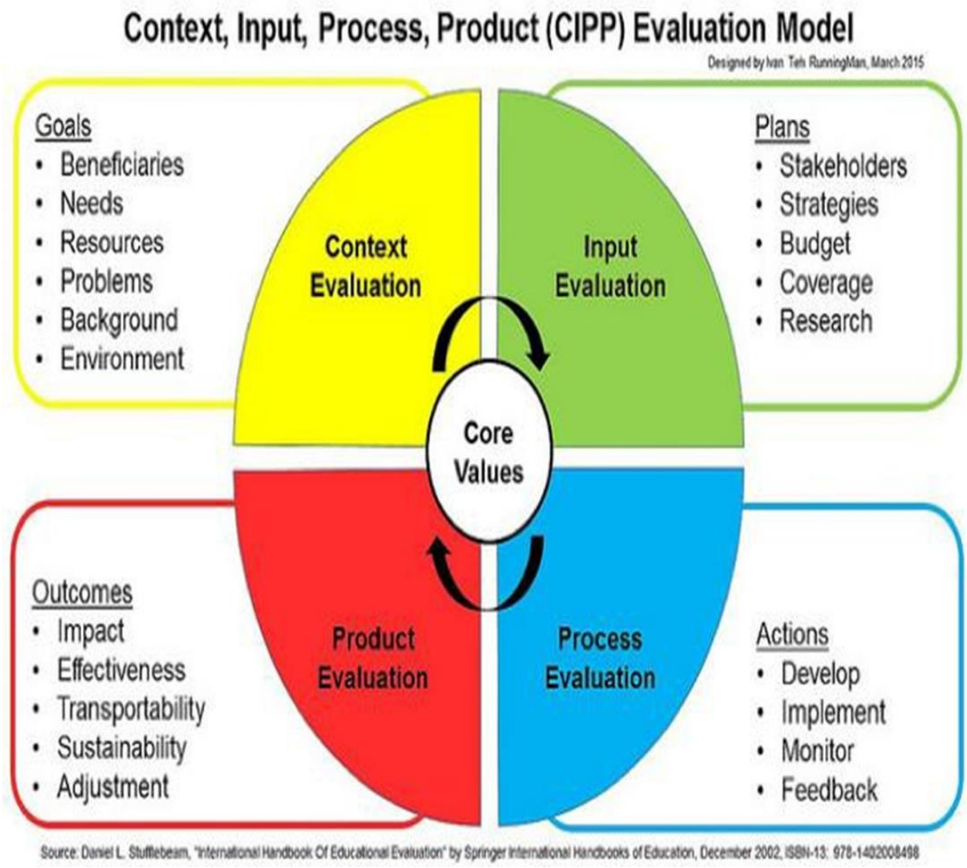

Figure 2: showing the structure of evaluation model- (Stufflebeam, 1971). According to (Stufflebeam, 1971), the CIPP emphasizes on the following.

1. **Context evaluation;** this resembles Stake's (1967) countenance model where he considers antecedents and involves in diagnosing the problems of a programme, the needs and unmet opportunities are identified. This contextual information then serves as a basis for the developing goals and objectives that will result in improvement of the program.

2. **Inputs evaluation**; the Objectives, strategies and materials are provided. This stage also involved in providing the designs of the project for implementation. The potential of these strategies to meet programme objectives is then assessed.

3. **Process evaluation**; this happen once the programme is put into operation. In this stage, the CCIP concentrates on implementing and monitoring the activities in the project. It also provides feedback to decision makers, who can then make modifications and improve program functioning.

4. **Product evaluation;** this stage evaluates the reports on whether objectives were attained or not then focuses on the adjustment. The strength of this model lies in the recognition of the role of context in which a programme is implemented.

The review of evaluation model above has revealed that, it is aimed at investigating the extent to which program intentions are met at implementation level. The study uses the evaluation models because it sets out to investigate the extent to which the school headmasters in public primary schools are implementing the intentions of the Building Education Foundations through Innovation and Technology program.

1.8 Conclusion

The chapter presented the background of the study in the brief overview to clarify the reason for the research, statement of the problem, the aim of the study from which the research questions, significance of the study which shows the beneficial to the research as primary schools head teachers, education stakeholders and the researcher as well. It had also shown the delimitation of the study. Theoretical framework which discussed the base where the knowledge of the implementation of Building Education Foundations through Innovations Technology constructed.

CHAPTER 2: LITERATURE REVIEW

2.0 Chapter overview

In this chapter, peer journals were critically reviewed literature that report on implementing of education technology in primary schools to promote quality education. It focused on an overview of reviewed journal articles on the importance of education technology and leader's effort to implement the EdTech in order to improve literacy and numeracy skills in standards 1 to 4. In the issue of head teacher's effort, the study emphasized on the importance of supervision and evaluation the implementation of BEFIT program to achieve the school setting goals. The purpose of this study was to investigate the implementation of educational technology in primary schools. As the study focus on the promotion of numeracy and literacy, an attempt was made to review the concept of educational technology in schools, advantages of EdTech, challenges faced in implementation of EdTech in schools and strategies used in the implementation of, EdTech.

2.1 Overview of the literature

One of the fundamental components of sustainable development in 2030 is quality education and educational technology have merged as an essential tool to achieve this goal (Qandri &Suman, 2022). The development of any society depends on quality of education, and the quality of education depends on the quality of head teachers, teachers, learners, and effective involvement of parents in education (Paschal and Mkulu, 2020). Nowadays, leaders have become agents of digital era who try to create a digital culture often with limited tie and resources but with the need to act efficiently in the face of changing global standards, (Johari *et al.*, 2023). Head teachers play a great role in making sure that quality learning is realized in schools. Their supervisory role is of most importance as it improves teachers‟ competency and students‟ academic excellence to promote quality and effective education. Teachers are in the best position to make decisions that directly

affect students‟ well-being and achievement (Stark & Jimerson, 2017). Therefore, one key concern for success of educational institutions is to ensure that quality education is well delivered by motivated teachers. The educational technology concept seeks to ensure that learners are provided with the most effective quality education hence the responsibility lies not only with the government but with the school heads, teachers, parents, and learners themselves for the education outcomes.

2.2 The concept of educational technology

The concept of educational technology is defined as a disrupting traditional education and teaching methods by offering both teachers and learners the ability to learn in an environment that makes use of now –common devices such as smartphones, laptops, and tablets. It is concerned with the development, application, and evaluation of system, and aids to improve the process of human learning. It could be conceived as a science of techniques, methods, and media by which educational goals could be realized. The concept was introduced two decades back and implemented by the Ministry of Education with support from USAID and other partners. In essence, educational technology provides learners with the access to quality education, support their holistic development and encourage their participation in classrooms.

The concept also aims at supporting the Government of Malawi's efforts to the global Education for All (EFA) also called Universal Primary Education (UPE) policy in the 1990s with the aim of getting all eligible school going children enrolled in primary education, (Nyirenda, 2021). The educational technology concept also helps Malawi to achieve the adaptation of Free Primary Education (FPE) (United Nations, 2015).

2.3 Need for educational technologies in education

Today we live in an age of technology which has undergone a significant transformation since its onset (Reinsfield, 2016). Currently, Educational technology has been designed to promote technological skills in literacy and numeracy, and technological perspective (Seery *et al.,* 2019). Most study emphasizes that schools should provide students with more technological teaching-learning activities (Seery *et al.,* 2019)

2.3.1 Chronology of education technology in Malaysia

The field of education has been no exception in undergoing changes in technology. For instance, in Malaysia, the study conducted in Bintulu at Sarawak showed that the use of computers began at the end of 1980s, (Johari *et al.,* 2023). The research was conducted to recognize issues in digital leadership that arise among school leaders in Malaysia. The results show that after the government decided to make a developed country, the Ministry of Education formulated a digital education policy to produce a digitally literate generation. The policy issued a new standard for school leaders to improve digital citizenship.

According to Johari *et al.,* (2023), previous studies conducted by other researchers found that due to the large impact of technology on education, leadership can have instructional outcomes which is more important than the school's technology infrastructure. There are several things that the government and stakeholders need to pay attention to ensure that school head teachers are always relevant as they prepare teachers and learners on the use of education technology. In other ways, current developments require school leaders who are aware of the changes that occur like Covid 19. Johari *et al.,* (2023), states that, the implementation of technology is very important in facing the upcoming challenges.

2.3.2 Digitalization in Scotland and Turkey

Edip *et al.,* (2021), conducted a study of Turkey and Scotland which places particular emphasis on technology education and technology use in education due to digitalization. The study found that, Scotland has established a unit under the Ministry of Education to keep up with technological developments and to draw a road map to teachers. Contrary to this, Turkey under Ministry of National Education in 2018, involved in the effective and efficient use of technologies especially on computer and Internet. The literature reveals that; countries are aware of the information of educational technology. It is a more flexible way of learning that requires accountability, good time management, and skills that need to be relied on due to the rise in the freelance economy (Aziz, 2018).

2.3.3 Educational technology in Malawi

In Malawi, currently, the Ministry of Education is implementing the BEFIT program in all primary schools to promote quality education as other countries. This means that, education concept is very vital to primary schools hence school head teachers need to engage with their subordinates to implement a program successfully. In this engagement, the school leaders can set an example as a role model for the school community. As the study indicated that there are still teachers who are anxious about the use of technology. These teachers require guidance from their leaders to have technological ideas hence head teachers need to involve themselves, actively train and support, give encouragement and be role models to their subordinates.

In addition, the need of educational technology in education sector have been backed up with different reviewed literature as follows:

Provide effective teaching and learning.

An effective school environment is also another aspect of educational technology. It is a school that provides quality education relevant to learners‟ needs for life and professional knowledge and talents to do something. An effective school focuses on continual improvement in their wider goals of students‟ practices and their levels achievements. Amemado, 2014; Al-Alwani, 2014; Glowatz & O‟Brien, 2017 conclude that educational technologies are important for modern education systems because it provides effective teaching.

Arouse lesson motivation.

According to Ozan & Taşgın, (2017), educational technologies play a crucial role in education because they have numerous benefits. Educational technology, arouse learners‟ interest when using technological tools as specialized tablets. The learners use these tools on individualized space than the normal lessons. It has important place in students‟ lives as it makes educational activities more fun (Budinski & Milinkovic, 2017; Aktay & Güvey Aktay, 2015). However, learners must use technology carefully in education and continuously update it and evaluate its effectiveness to enhance learning, (Dolenc & Abersek, 2015).

Improves numeracy and literacy.

Technology is everywhere and entwined in our daily lives so much so that schools teach students how to use it to turn into technology-literate individuals (Bektaş *et al.,* 2014). Head teachers and teachers should have an important mission to teach learners how to use technology and when and where to use it. And also, to use effectively, creatively, responsibly, and wisely. Technology education aims to help students acquire technology literacy. It also provides students with the opportunity to learn technological know-how, techniques, and strategies (Hashmi & Gilani, 2018).

Boklage, & Wook, (2016) emphasize on the importance of primary school head teachers setting goals and vision for technology, supporting teachers‟ professional learning, and practicing shared leadership when introducing technological innovations. However, there are challenges that hinders the implementation of educational technology, such as a lack of enhancing current knowledge, not managing data for planning well, a lack of computers and devices for learning and a lack of engagement (Sheninger, 2014).

2.4 Challenges faced in implementing educational technology.

The results of the study conducted by Ugar and Koc, (2019), in Bandung city reveals that, school administrators should have a clear vision of their role in technology integration and implementation because it is an essential function of their duties as instructional leaders. The study focuses on five dimensions, i.e., perception of utility, perception of easiness of usage, utilization attitude, behavioral intention, and actual technology use. According to Ugar and Koc, (2019), the user‟s attitude towards the system is the main determinant of whether the user will use or reject. The discussion of Ugar and Koc, (2019), shows that, the main challenges of school leaders appear once they lack enough course and training on how to implement the use of technology. They also added that, the limitation of school budget, resources, poor network infrastructure, resistance to change and cultural problems can hinder the implementation of the usage of educational technology. They also state that the attitudes of school principals dealing with new technologies in professional development will persuade, promote, and support teachers and leaners as they engage in new learning opportunities.

This challenge has created a need to examine school leadership to meet the needs of this evolving world (Brown & Bryant, 2015). The past explorations of global and local survey on challenges in education technology have demonstrated that school headteachers experience a huge range of

difficulties in their practices. These difficulties can be summed up under five significant topics as technology training, resources, utilization of learners, teacher's perception, and assets. Each subject contains various interrelated difficulties that have been found because of different surveys as;

Teachers and learners' perceptions

Harris, (2016) survey indicated that, adding technology in the classroom does not translate into better teachers or better educational outcomes. However, when teachers are inspired to use technology effectively, outcomes tend to improve (Sharma & Singh, 2017).

Yet, teachers can utilize technology applications as a simulation of the real-world, creating the opportunity for learners to explore authentic tasks, such as interacting with people in different cultures, exploring various locations around the world, and gathering information to solve meaningful problems. Rosenberg (2013), indicates that, focusing on how teachers integrate technology into their teaching is more important than focusing on what tool teachers integrate into their practice. For effective implementation, teachers must understand how to connect technology with pedagogy and curriculum standards.

There is need to address challenges that affect innovations and need for leaders and school stakeholders to create the effective strategies that can applied to programs (Masperi and Hollow, 2009). The study revealed that, the limitation of school budget, resources, poor network infrastructure, resistance to change and cultural problems can hinder the implementation of the usage of educational technology. They also state that the attitudes of school principals dealing with new technologies in professional development will persuade, promote, and support teachers and leaners as they engage in new learning opportunities.

Ugar and Koc, (2019), stipulates that even with latest technology, people cannot ignore the dimension of users‟ attitude. This study finds that the dimension of users‟ attitude in primary schools in Panyileukan Sub-District, Bandung City scores the lowest. This needs to be remedied because users‟ attitude towards a system is the primary determining factor whether they will accept (use) or reject the system. Lapek, (2017) in the study suggests that students have developed and mastered 21st century skills, students will be able to use these skills to positively respond to changes in the world and solve problems that result from the changes.

Administrative support

Ling & Ling, 2016; Sun & Leithwood, 2015 conducted a study to investigate the role of leaders in schools. The study shows that, by following other case studies, the principals‟ efficacy in leading change within a school. It is known that educational leaders influence teachers by promoting the organization's vision and goals and by providing resources that support teachers in their effort to teach learners. Though indirect, the effect of leadership on school personnel is important.

McLeod & Sauers, (2015) explained the importance of leaders creating a collaborative vision with staff to increase technology-supported pedagogy. School leadership is a priority in education because it plays a significant role in the outcomes of the school. Whenever leaders influence the motivations and abilities of teachers it changes school climate and environment.

Today's global, digital, intercultural, and changing society poses multiple educational challenges (Tourón *et al.*, 2018). Thus, school leaders will play a key role in the educational transformation needed to meet them. They are the first movers and main agents promoting and managing the required digital revolution and the school leaders must balance the needs, motivation and expectations of teachers, learners and community.

Availability of resources

Technology education requires infrastructure and tools and materials. Inadequate infrastructure and lack of tools and materials hinder technology education. According to Hašková and Dvorjaková (2016), the approach to technology education depends on the school facilities and technical equipment available. Therefore, the stronger the infrastructure and the availability of resources, the more different and effective methods teachers can use to deliver technology education. Some teachers in Turkey work in schools with inadequate infrastructure and resources which hinder the promotion of quality education, that is according to the survey of (Edip *et al.,* 2021).

However, the potential, success, and institutionalization of educational technology in the education system in Malawi is very much dependent on engaging with challenges such as the need for teacher training (Hubber *et al.,* 2016). This is because teachers have often reported being underprepared for the use of technology. Teachers who participated in the training have potentials to participate in implementation of education technology. Teachers who receive organizational or structural support for their change initiatives can disseminate their innovative professional activity beyond their classrooms (Härkki *et al.,* 2021; Messmann & Mulder, 2014; Reinius *et al.,* 2021; Vennebo & Ottesen, 2015).

Nowadays, schools' digital transformation is an educational priority, and digital content will play a fundamental role in ensuring the success. Both students and teachers will need to develop digital competence, and leaders' influence will be decisive in the efficient acceptance and use of specific strategies that match learning objectives. Learners know the educational context and, through their leadership, can influence the pedagogical approach used at schools, serving as a keystone for the quality education.

In addition, some of the countries like Nigeria, Kenya, Turkey, and Malaysia have been in a position of creating programs that provide academic and emotional support to learners. However, they have been facing challenges in implementing educational programs. As such these have affected the learner's academic performance. Furthermore, lack of trained school headteachers and teachers who can implement educational technology strategies is a challenge in the different countries especially in Sub-Saharan countries in Africa. Some of these responsible people may embrace the idea of involving parents in schools but are not used in effective ways.

2.5 Techniques of implementing educational technology

Nalda *et al.* (2020), conducted a study on the strategic influence of school principal leadership in the digital transformation of schools which paid special attention to implementation of educational technology should integrate leaders into their core definition, considering factors such as their age or teaching and leadership school leaders and their leadership from a strategic pedagogical perspective for the Spanish school leaders. The study emphasizes on digital innovation and strategic plans to achieve their goals. The experience. Today's global, digital, intercultural, and changing society poses multiple educational challenges which need school leader's skills and capabilities to face those (Tourón *et al.,* 2018). They should also consider contextual factors, such as school size and complexity and the school's digital culture. School leaders' leadership can facilitate a digital culture transformation, not through their authority or bureaucratic influence, but rather their capacity to foster an open debate that allows educational communities to see the integration of education technology into pedagogical models as an opportunity to improve learning outcomes. School leaders must play a key role in the educational transformation needed to meet them. They are the first movers and main agents promoting and managing the required digital

revolution. They must balance the needs, motivation, and expectations of teachers, students, families, and community.

Nyongesa *et al.,* (2018), conducted a study in Kenya on the influence of primary school leaders to promote learner's performances. In addition, in Canada, Begley *et al.,* (2013) found that intrinsic motivation including a commitment to lifelong teaching and learning with an aim to make a difference were strong attractors to school leadership which promotes the positions of learner's performance. Similarly, in Ireland, school leaders influence the promotion of learner's performance and also, they are keen to influence school culture (IPPN, 2016).

In Africa, head teachers are scarcely prepared for their leadership tasks (Bush & Oduro, 2014). Based on Ozuruoke *et al.,* (2013) study on public schools in Nigeria indicates that many leaders have not considered their styles and types of leadership as determinants of teachers‟ job performance in their schools. Hence, they further pointed out that some of school leaders seem to find it difficult to effectively administer their schools. As such, leadership styles and types occupy an important position in school management in Nigeria.

In Kenya, there has been clear indication of the declining quality of public primary school education because of large numbers of students, a disproportionate teacher-student ratio and highly inadequate financial and physical resources. This has led to the increase in low levels of numeracy and literacy (Njuguna, 2013).

Educational leaders in a school must have the skills required of the age and be proficient in technology leadership. In this way, it will lead all school stakeholders such as parents, teachers,

students, and education administrators to use technology correctly in daily life. In this way, school stakeholders can be aware of the possibilities and convenience of technology.

2.6 Conclusion

The inclusion of international literature review like Malaysia and Scotland's in this Malawians' context study was because the studies centered around the need for rigorous teacher training, classroom integration, appropriate deployment of technological tools, the studies also emphasize the need for leaders to create the effective strategies that can applied on technology. They both had one key concern for success of educational institutions by using educational technology. The literature from this chapter revealed the meaning of the concept educational technology and challenges faced by school leaders in implementation of educational technology. It also revealed that the school headteachers, teachers and learners are responsible to implement the innovation of educational technology to improve education in primary schools.

CHAPTER 3: METHODOLOGY

3.0 Chapter overview

The aim of the study was to find out how primary school headteachers and stakeholders implement the use of education technology in their schools. The chapter discussed the methodology, techniques and measures used to collect data. The study focused on research paradigm, approach and design, the study sites, participants, sampling size and sampling techniques, methods and instruments for data collection, data analysis, reliability and validity information, ethical considerations and planning for data analysis techniques.

3.1 Research Paradigm

The study adopted interpretivist paradigm. The concept assumed that reality is subjective, multiple, and socially constructed. According to Pervin and Mokhtar (2022), researchers can understand someone‟s reality through their experiences of that reality which involves researchers to interpret elements of the study, thus integrating human interest into a study. The paradigm was concerned with in-depth understanding of the phenomena and its complexity in its unique context instead of generalizing the whole population (Creswell, 2009). Similarly, (Saunders *et al.,* 2016; Bhattacherejee, 2018) agree that interpretivism also aims to include richness in the insights gathered rather than key variables and factors that can be generalized and applicable to everyone. The paradigm believed in relativist ontology and subjective epistemology.

The paradigm was relevant to this study because of its nature to have an in-depth understanding on how primary headteachers implement the use of EdTech in public schools. The researcher's went into the natural setting to get primary information on how the concept of educational technology is implemented. Although the paradigm had its weakness, the researcher decided to

use it because of the data generated through interpretivism studies are associated with a high level of valid due to the primary data collected which are trustworthy and honest.

3.2 Research Approach

The research followed the qualitative approach. According to Cohen *et al.*, (2018), the researcher finds answers to questions through observation, participation, and involvement. Teachers were asked questions through interviews to find out their perceptions of their leaders on the use of Education Technology. It relied on questioning and observation to discover or generate a rich and deep understanding of the phenomenon which was investigated. The researchers had curiosity to discover and explore how people make sense of their surroundings, how they understand other people's activities, and how they perceive interpersonal-social relationships in the contest they are surrounded in (Rubin and Babbie, 2014). It is important that researchers should spend time with their participants to build mutual trust so that participants would likely to provide complete and honest data for the purposes of research (Pervin and Mokhtar, 2022).

3.3 Research Design

The study used case study because the researcher wanted to have a holist picture and in depth understanding of the study. This assisted the researcher to get first-hand information from the participants within their natural setting. This implies that the study had a social interaction with the participants and build confidence to interpret the information which was collected during the research process. Wang and Gaela (2015) agree that qualitative research involves an interpretive and naturalistic approach. This means researchers study things in their natural things to interpret phenomena in real meaning.

3.4 Research Setting

The researcher decided to conduct this study in Nkhotakota districts. Nkhotakota district is a remote area hence wanted to find out how school headteachers are implementing in rural areas. The study, therefore, assumed that if schools with same setting like in Nkhotakota district are facing challenges in the implementation of the EdTech, the problem might also be assumed either the same or worse in the other schools of the same setting.

3.5 Study Population

The study was purposive because it focused on the headteachers, deputy head teachers, section heads, teachers, learners and Parents Teachers Association (PTA) members. The participants were trained in different skills on how to handle EdTech. As such, they were expected to provide relevant information. Similarly, the junior section heads have been trained with leadership skills at school level on how to conduct their duties and they also have a true reflection on how things are on the ground.

3.6 Sampling Size

Table 1: Sampling Techniques and size

Sampling Technique	**Respondent category**	**Number**	**Remark**
Convenience sampling	Primary schools practicing BEFIT	2	Primary school in Nkhotakota (both junior and infant sections were included)
Purposive sampling	Head Teacher,	2	
	Deputy Head teacher	2	
	Head of section	4	
	Teachers	8	
	Learners	12	
	PTA	4	

Note: The respondents have been abbreviated as follows Headteachers (HT1 and HT2-representing both schools), Deputy headtecher (DHT1 and DHT2), Head of section (HSS1, HSS2 and HJS1, HJS2), Teachers (TJS1, TJS2 and TSS1, TSS2), Learners (LSS1, LSS2 and LJS1, LJS2) and Finally, Parent teachers association (PTA1….PTA4 –inhere two representative of PTA where selected at each school) respectively. The researcher used a purposive sample of 32 participants from two selected public primary schools.

3.7 Sampling Techniques

A sample in research refers to any group on which information is obtained while sampling is the process of selecting a few from a big group as a basis for estimating or predicting the prevalence

of an unknown piece of information, situation, or outcome regarding a big group (Kumar, 2014:229). The study targets a sample of 32 participants. Purposive sampling technique by Marshall and Rossman (2011) was used to select research participants. The researcher selects information rich respondents who provide relevant information to the study. In this regard, the researcher had school stakeholders who provide rich information

3.8 Methods for data collection

3.8.1 Interview

To identify the factors that led to implementation of BEFIT and challenges that head teachers face and investigate the strategies which they use to promote the implementation of BEFIT, the researcher used semi-structured interviews for collection of data in two public schools of Nkhotakota district. Specifically, the researcher was interested in unearthing participants‟ opinions, experiences and beliefs of the dynamics surrounding their understanding of their knowledge digital technology. The teachers and learners were interviewed. According to Cohen, Mario and Mourisson (2018), structured interview is an effective method for providing reliable and comparable qualitative data with different participants, even given different interviewers. In this regard, an interview guide was a tool or instrument to serve the researcher in the process.

To investigate the strategies which the headteachers and teachers use to promote the implementation of BEFIT, the researcher was interested in unearthing participants‟ opinions on the methods that align with the program. The structured interviews were recorded using audio recorder. This instrument was beneficial to the researcher as it records the whole interview and stores the data for analysis. Buying the line of thought by Cohen, Mario, and Morison (2018), interviews can provide rich and detailed data on the participants‟ perspectives, motivations, feelings, and experiences. Since the researcher believes views and opinions are subjective, the

issues surrounding the implementation of BEFIT could easily be undertaken qualitatively through semi-structured interviews using an interview guide as an instrument. Besides, these interviews were conducted by the researcher to avoid data loss and extra cost on hired interviewers.

3.8.2 Observation

To find out the factors that influence the implementation of BEFIT program, the researcher observed the organization structure of schools. The study looked if there is enough supervision when using tablets and if the tablets are adequate for the learners. Observation also unearthed participants‟ opinions on how they influence the implementation of BEFIT program. By observing the environment, the study also looked for structure, plan, and time frame of this use of EdTech tablets. The information was recorded in an instrument known as observation guide. The observation method was successful because it pleased the research objectives by capturing relevant events and participants. According to Roller and Lavrakas (2015), an observation guide reminds the observer the key points of observation as well as the topics of interests. It also acted as impetus for reflexive exercise which the observer could reflect on his or her own relationship and contribute to the observation at any moment in time.

3.8.3 Instruments for Data Collection

This study used the interview and observation guides as the instruments for collecting data. The interview guide is the list of high topics that you plan a covering in the interview with high level question that you want to answer under each topic (Creswell, 2007). While observation guide is the document that allows to channel the action of observing certain phenomena. For instance, the environment that exists inside and outside the classroom, what strategies are used for the implementation of the BEFIT and what challenges are they facing during this period of teaching and learning.

3.8.4 Data analysis

Data collected through interviews and observation was analyzed using thematic data analysis. The responses were voice recorded, transcribed, and finally coded. According to Gibbs, (2007); Braun & Clarke, (2006), Coding refers to the process of naming or labeling the data and categories. In this regards identification of codes from the interview transcripts and generate and revise themes from the coded data is done based on researcher's review Braun and Clarke (2006), was adopted in the process of thematic analysis. Data triangulated as a means for seeking convergence Creswell, (2012), across the survey was observe with interviews held with learners, teachers and school management.

All audio recordings were transcribed verbatim, regardless of how comprehensible the transcript was. Transcripts were read multiple times, for the researcher to familiarize with the data. Following transcription of the data, the researcher utilized thematic analysis to extract common themes, patterns, and relationships. During data analysis process, interview transcripts were hand-coded to identify conceptual themes that were clear within both the research literature and the data collected. Thus, segments of the material or information collected was allotted to the categories of a coding frame. Coding therefore was a preparatory step for accessing the data and making them ready for interpretation. Each theme was analyzed to gain a deeper understanding of the participant's perceptions and opinions.

3.8.5 Validity and reliability

This study used various strategies as recommended by Merriam and Tisdell (2016) to enhance rigor and trustworthiness and to promote validity and reliability. The study adopted different data collection methods, that is, participant observations, focus group discussions (FGDs) and semi-structured interviews. This strategy minimized biases that would have arisen in the use of just one

method of data collection and ensured consistency in the interpretation and discussion of the findings. This approach demonstrates that both care in the process of research (credibility) and possible future uses of the findings (transferability, dependability and confirmability) have been adhered to the research.

3.8.6 Trustworthiness

The qualitative research often uses credibility and trustworthiness criteria (Twining et al., 2017). The study used methods and procedures that will yield to accurate and believable result. Kivunja (2017), agrees that the principle of accuracy considers who is responsible for the authenticity, fidelity, and accuracy of the information. Similarly, it considers how the researchers cross-checked with participants, so they know what the researcher have recorded the data accurately, (Kivunja, 2017). In this case, the researcher went back to schools to present the results to confirm the conclusions from the perspective of the participants themselves. The study used instruments that generate appropriate data relevant for the study. The participants were selected using purposive sampling which allowed the participants responsible to be flexible to express themselves. The study had an in-depth interview to generate firsthand information and be focused on the areas of topic of study to overcome the biasness. The reliability and accuracy of the study was tested through methods of verification that allowed participants to listen to the conversation and verify their comments. In addition, the researcher used actual participants of the reader. Furthermore, triangulation was used to ensure credibility during the study. The multiple data sources such as interviews and observation provide room for triangulation for credibility of description, conclusion, and interpretation.

3.8.7 Ethical considerations

The researcher kept the answers strictly confidential. Prior permission was obtained from the target respondents before conducting the research. To render the study ethical, the rights to Self-determination, anonymity, confidentiality and informed consent were observed. Written permission to conduct the research study was also obtained from the relevant authorities.

3.8.8 Conclusion

In this chapter the research design and methodology underlying the study were described. The discussions of the research paradigm and research approach were presented. This chapter also provided a discussion of the ethical considerations and the trustworthiness of the study.

CHAPTER 4: FINDINGS

4.0 Chapter overview

This chapter presents the findings from the data collected in selected primarily schools of Nkhotakota districts. The analysis followed Braun and Clarke's (2006) thematic analysis approach. The data is structured according to the study's three main objectives, triangulating responses from headteachers, teachers, students, head of sections and parent teachers' associations. Through this analysis, the study identifies common themes, underlying issues, and practical strategies.

4.1 Response rate

Out of 32 participants, interviewed in the two schools all participants were available and complied to the exercise freely and willingly, giving a total of 100% respondent rate. According to Mathew (2022), a good survey response rate ranges between 5% and 30%, hence, this study's response rate (100%) was found to be appropriate.

The first objective aimed at identifying factors that contributed to the implementation of Building Education Foundations through Innovation Technology (BEFIT) in primary schools. The following table gives a summary of influencers of EdTech. The following are the themes that emerged from qualitative data on factors behind the implementation of BEFIT program in primary schools. Remarks highlight summary of respondent's response.

Table 2: Influencers of EdTech

THEMES	CATEGORY	CODES	REMARKS
Challenges with traditional education system	Student engagement and retention Issues	-Absenteeism	-high rate of absence to class can contribute to school dropouts
		- Dropouts	-lack of engagement, commitment, and insufficient resources lead to increased dropout rates
	Educational technology and infrastructure	-Inadequate learning material, high enrollment -inadequate infrastructures -adoption of EdTech	-Shortage of textbook -high rate of primary school intake -Lack of classrooms blocks due to high enrollment and low funds for constructing new blocks -need for student to transform to more digital learning era
THEMES	**CATEGORY**	**CODES**	**REMARKS**
Academic and professional performance	-Learning challenges	-Low Literacy Skills -Low Numeracy Skills	-Students struggle to read and write effectively, poor resources and teaching lead to inadequate mathematical understanding
	Staff /teachers quality and capacity	-under qualified	-There was shortage of qualified staff, thus making it difficult to deliver the content

4.2 Challenges in education system

4.2.1. Student engagement and retention Issues

Student engagement and retention are critical issues in education, where a lack of active participation in the learning process leads to disengagement, and students abandon their courses or programs before completion. This results in high attrition rates, which can negatively impact the overall success and effectiveness of educational institutions

4.2.1.1 Absenteeism

One of the common and well established reason behind the establishment of BEFIT program was high rate of absenteeism by students, which threatens their ability to continue with their studies. Some of the factors contributing to absenteeism include health issues, financial constraints, lack of motivation, and family responsibilities.

This was what one of the respondents said in an interview:

> *There was high rate of absenteeism there at this school, this was so because parents encouraged their children (students) to go to cassava farms and earn a living. This is in response to support their parent; thus, school been seen of less importance. (HT1, 2024)*

In another interview with deputy head teacher, this is what he said:

> *There is lack of motivation from the parent to their children, perhaps since most of them did not go far with their education (DH2, 2024).*

4.2.1.2 Dropouts:

Dropout rates are particularly high in developing countries, where factors like socio-economic pressures; such as poverty and lack of family support, contribute to student disengagement. School dropout has also been linked with absenteeism resulting to poor performance in class. Thus, complete dropout of school on failure to cope up with other student who constantly are available for classes and to those who perform well. During an interview one of the respondents asserted that:

> *Learners from Lakeshore areas had tendency of dropping out from school due to fishing activities but these tablets arouse their interest to attend classes (DH1, 2024).*

4.2.2 Educational technology and infrastructure

EdTech and infrastructure in education sector involves integrating technology to enhance learning experiences, improve accessibility, and increase efficacy. This encompasses various aspects, including teacher professional development, which provides teachers with training and support to effectively integrate technology into their teaching practices, enhancing their professional development and student learning outcomes. (UNESCO, 2019)

4.2.2.1. Adoption educational technology:

There was need to adopt to new learning model for instance the use of digital tool. As world is advancing to more global community the use of technology is inevitable to the world. One respondent had this explained

> *Because we are in digital era, learners are supposed to be familiar with tablets (HT1,2024)*

However the adoption rate is challenged with resistance to adoption by teachers as well as some leaners, bring in low rate of adoption on the program.

> *There is resistance of teachers to participate due to lack of allowances. Other teachers believe that the government must allocate allowances in this program. "Madam it's too involving, the process is tiresome and to sum it all up it is extra baggage to us teachers." And other student also resist to adopt as the technology is time consuming and two involving (HJS2, 2024)*

4.2.2.2 Inadequate Infrastructure:

Poor infrastructure is a major challenge, especially in many public School resulting into Classroom Overcrowding. Overcrowded classrooms present a significant challenge, schools with high enrolment face difficulties for teachers to deliver personalized instruction hindering the effectiveness face to face learning interactions. One of respondent said

> *High school enrolment due to free education in public primary schools and low funds for constructing new blocks from the government or other entities, has resulted into overcrowding in classes with drastic increase in the number of teacher to learner's ratio (DH2, 2024)*

> *The tablets are inadequate so it is difficult to conduct the session in my class. Mmmh, standard 3A learners' enrolment is 259 and there are only 230 tablets available (TSS2)*

Apparently, in one class there could be 295 learners according to explanation by one teacher (TSS2), in most cases only about 2 classes were available for student from junior section to senior section, where in most cases this number was not equivalent to number of student in one section.

4.3 Academic and professional performance

4.3.1 Learning Challenges

Learning is a process that involves the teacher, parent and the learner, however this process is jeopardized by several barriers; which include language, too many students in a class, lack of supervision by heads of schools, lack of library, qualified teachers and lack of motivation to students (Ciroma, 2014).In which according to the finding low literacy skills and low numeracy skills were part of education learning challenges.

4.3.1.1 Low literacy skills

Many learners in Nkhotakota struggle with literacy. Limited access to reading materials and lack of guidelines exacerbate this issue. Students struggle to read and write effectively due to lack of resources and instruction. This is what one respondent said:

> *With the introduction of free education in primary school, most of the schools have insufficient textbooks due to increase in number of enrolled learners (HT2, 2024*).

4.3.1.2 Low numeracy Skills:

Similarly, low numeracy skills are dominant, with students facing difficulties in grasping basic mathematical concepts, often due to inadequate teaching resources and ineffective teaching methods.

Based to the class observation most student in senior section failed to count numbers from one to ten and on the other hand, from the junior section they two struggled to count from one to five,

and even struggling to pronounce the words in all section, as some would stammer frequently while other just give up counting.

4.3.2 Teacher Quality and Capacity

Capacity building is a process that helps individuals, groups, and organizations improve their skills and adaptability to better respond to change. It is closely linked to improving the quality of human resource and creating the right environment for organizations to work effectively and achieve their goal (Morrison, 2001; Sudrajat, 2021).

Most teachers are holders of Certificate in education, however a significant number of teachers had limited knowledge of digital learning technology. Despite receiving some training from BEFIT officers, those with minimal technological knowledge faced challenges in effectively delivering the content.

4.3.2.1. Underqualified teachers:

A significant number of teachers lack formal training in both tutoring and the use of educational technology. The teacher-student ratio further hampers the ability to provide individual attention, the teacher-student ratio further hampers the ability to provide individual attention, especially in overcrowded classrooms. To overcome the challenge of class overcrowding, there was need to introduce new teaching methods. Head teacher explained.

> *The government is failing to implement the teacher-ratio of 1 to 60 due to large enrolments hence the tablets have instructors who guide learners on what to do during BEFIT sessions (HT2, 2024)*

According to the observation by the investigators in one of BEFIT session, student would go up to three or four turns for one class to be finished, having a total number of 90 to 100 students in one class per teacher (1 to 100 ratio) and however this do exceed in most classed, as explained by one respondent.

> *"Teaching large classes is one of the major problems that we teachers face here. The enrolment for classes 3 and 4 is 571 learners. Standard 3A has 259 learners and is the largest class out of all classes. Standard 3B has 189 learners and standard 4 has 164 learners" (HSS2, 2025).*

Apparently, in one class there could be 295 learners according to explanation by one teacher (TSS2), in most cases only about 2 classes were available for student from junior section to senior section, where in most cases this number was not equivalent to number of students in one section.

The BEFIT initiative aimed at addressing key challenges that included student engagement, teacher quality, and learning outcomes through the adoption of educational technology.

The second objective aimed at identifying challenges faced by the head teachers during the implementation of the Building Education Foundations through Innovation Technology in primary schools. The following table gives a summary of barriers in adopting EdTech.

Table 3: **Barriers of adopting EdTech.**

THEMES	CATEGORY	CODES	REMARKS
Professional and knowledge development	Staff/teachers engagement	-lack of teacher's incentive -Teachers attitude towards BEFIT program	-Teachers struggle with insufficient training in digital technology, leading to frustration and underutilization of new tools. Many educators, especially those from pre-digital backgrounds, hindering collaboration. Some students prefer gadgets over traditional methods, complicating interactions and making it difficult to track individual progress.
	- Students Engagement	-Students Attitudes -Academic Progress	
Parents and community engagement	-Parents support	-Parents perceptions	-Some parents do not encourage their children to go to school-due to family business
Technology adaptation and challenges	-Personal challenges -Gadget challenges	-Service and repair -Resistance -rate of adoption -Network failure -inadequate supply -security measure -time consuming	-delays in repairs for broken devices, some teachers prefer traditional teaching methods, and both students and teachers find the learning process time-consuming. Connectivity problems can disrupt sessions, inadequate tablets for all learners. Finally, the tablets are portable and easy to steal.

4.4 Professional and knowledge development

Professional and knowledge development is ongoing process of acquiring, enhancing, and refining the skills, knowledge and expertise needed to perform a job or profession effectively (American Psychological Association, 2020).

In most case only refresher meeting is conducted by the headteacher to their staff, with little training that is usually provided by the BEFIT officers at the beginning of the project. Which does not suffice the required knowledge to implement the project. One respondent explained.

> *We are conducting refresher meeting twice a term to encourage teachers to work hard for the betterment of learners (HT1, 2024).*

4.4.1 Lack of teachers' engagement

The data collected under this theme highlighted key components that hinders the implementation of BEFIT as faced by the head teachers which includes the lack of training and resistance from some teachers, lack of incentives and the difficulty of integrating ICT into existing teaching methods. Attitudes of teachers also hinder the implementation of this BEFIT program. Some teachers are just negatively minded about the project which results in them reluctant to learn, teach and even adapt to the new technology. One section head (junior section) explained that:

> *Several teachers are resistance (resistant) to change and to them an extra work needs allowance (SHJS1, 2024).*

And another respondent said that:

> *The senior class teachers do not want to assist on BEFIT sessions. They always give an excuse saying, "We are not junior and infant classes hence we cannot afford to conduct the sessions." This causes problems because all teachers undergo BEFIT training to have*

the knowledge so that there is no shortage of teachers. All teachers must assist. Other teachers demand allowances as they say, "This program consumes our own time which we could use to conduct part-time lessons at home." Many teachers prefer to do their own BEFIT programs off campus than conducting BEFIT sessions which have no incentives (DHT1, 2024).

The other challenge is resistance of teachers to participate due to lack of allowances/ incentives. Other teachers believe that the government must allocate allowances in this program.

Madam it's too involving, the process is tiresome and to sum it all up it is extra baggage to us teachers. (SHJS2, 2024)

4.4.2 Learners engagement

Student engagement refers to the level of involvement and interest students show in their learning, as well as their connection to their classes, institutions, and peers (Axelson & Flick 2010). According to Fredricks *et al.*, (2004), three types of engagement are identified; behavioral engagement involves participation and following norms; emotional engagement relates to feelings like interest or boredom; and cognitive engagement is about motivation and using strategies for self-directed learning. Thus, engagement ids well correlated with physical and psychological ability to be involved towards achieved a goal.

4.4.3 Students Attitudes

Participants indicated that student's attitudes towards use of digital tools varied: some were positive while others were negative. To some student the use of tablets diverted their attention from teacher, while to others preferred to the taught by the teacher alone. Sharing of tablets due to large number of students also made it impossible to follow up the progress of each student, as the

other usually continue from where the other student left. Presented below is a selected sample of what the participants said on this:

> *One of the other problems is that most of the learners prefer to learn using technological gadgets than being taught by their professional teachers. "These tablets shift the focus of learning from the teachers to the technology." (TJS1, 2024).*
>
> *Other learners show more interest to the BEFIT session because they are aroused by the tablets. They sometimes boycott the traditional teaching and focus on BEFIT only because of the stories and traditional dances installed in the tablets (SHIS2, 2024).*
>
> *One tablet is used by four learners. Thus, learners do not know whether they are progressing or not, as there are limited gadget and more student to attend to (TIS1, 2024).*

The BEFIT program on the other hand is in such a way not inclusive for special needs children, therefore making it difficult for them to learn. For instance, children with arm disability, deaf or blind, could not use these gadgets as these issues were not incorporated in the program. Hence, teacher had to spend more time to tutor those with such disabilities. One teacher explained:

> *I have two special needs learners; one is deaf and the other cannot speak. It is very difficult to help them operate the tablets, but I try my level best. I think they overlooked the concept of inclusive education which accommodate all learners despite other challenges (TJS2, 2024)*

Some students felt the use of tablet is time consuming and so do other teachers including head teachers, as the program requires their teacher to instruct them in some point and for the whole class to catch-up needs extra time. This makes other learners to get bored and willing to withdraw. Lack of enough training to the student on how to operate the tablets and little attention or

motivation is shown by the head teacher or teachers once the tablet lessons begin. Other students explained:

> *The tablets are not enough in our class. Sometimes we must learn with other classes that are smaller in numbers. It is uncomfortable learning with a different set of learners that are not our classmates (LJS2, 2024)*

> *We were not trained on how to use these tablets before the lessons. All we were told is to turn on the tablet and listen to the instructor who acts as the teacher (LSS1, 2024)*

Poor engagement of students contributes to poor performance in class, and this does not only affect the BEFIT program, but also other lessons are affected.

4.5 Technological challenges

4.5.1 Gadget challenges

Another area that was deemed important by some participants was technological challenges in reference to the implementation of BEFIT program. Some of the challenges include network failure, inadequate supply, security measure, time consuming and gadget repair/ servicing. Participants indicated that, the technology is time consuming as the tablets need to be moved from one place to another, get connected to internet failure of which the gadget will not operate. Other issue was security of the gadgets as some still went missing despite of the security. Lack of enough technicians to repair broken gadgets was another issue and the tablets were inadequate. Some respondents explained:

> *When the tablets have faults, we communicate to the technician officials, and they usually respond after a long while. It took too long for them to come and repair the phones (PTA1, 2024).*

The tablets are inadequate, so it is difficult to conduct the session in my class. Mumm!! Standard 3A learners' enrolment is 259 and there are only 230 tablets available (TSS2, 2024)

4.6 Parents and community engagement

4.6.1 Parents and community support

Some parents do not encourage their children to go to school despite the program and its benefits. However, they encourage them to go and farm. Other community members are not concerned with BEFIT program and even the misconducts of their children like stealing and breaking the tablets t. One PTA member explained:

A learner managed to steal the whole set of learning device which comprise a tablet, headset, and USB code. We were able to catch him and let the parents pay for their misconduct (PTA2, 2024)

The third objective aimed at investigating strategies used by the headteachers in promoting the implementation of Building Education Foundations through Innovation Technology in primary schools. The following table gives a summary of methods used to adopt EdTech.

Table 4: Methods used to adopt EdTech.

THEMES	CATEGORY	CODE	REMARKS
Leadership and management	learners' engagement	-Parents and learners training	-ensures that parents and learners are regular trained on (early stage) the implementation of the program
	Community and Stakeholders' involvement	-Regular updates	-institutions ensure that stakeholders are regularly updated on the development of the projects
	Infrastructure and resource management	-addressing concerns	-Stakeholders are involve in formulating and implementation of bylaws. e.g., deploying security guard to protect the materials
Collaborative Environment	Teachers' collaborative	-encourage Teamwork	-teachers are encourage by the Headteacher to adopt the new era of digital learning
		-Program implementation	-in order to have a vibrant and enough time, the program is allocated at the end of timetable
	Gender equity and responsibility sharing	-Lessons delivery -random supervision	-Headteacher promotes teachers' teamwork and encourages all section teachers to work together -Teachers are encouraged to monitor and supervise leaners randomly

4.7 Leadership and management:

4.7.1 Leaders engagement

Headteachers were responsible to set clear goals, aligned with program objectives, and foster support to encourage technology adoption. They emphasized student-cantered learning and integrated ICT tools into the curriculum to foster active and independent learning. Ensured that learners were regularly trained on (early stage) the implementation of the program. One respondent emphasized that:

> *Early in the process learners are provided with ongoing training to refresh their brains (HT1, 2024).*

To promote high attendance and engagement of learners in school, head teacher regularly organize meeting with community, to encourage them to send in their children to school.

> *Conducting PTA meeting with an agenda in line of reminding parents to encourage their learners to attend classes every day. "Imagine, other parents take their children to the lake for fishing activities during learning hours. So, we usually condemn such malpractice. (DHT2, 2024).*

4.7.2 Community and Stakeholder engagement

Headteachers engaged with local communities, parents, and stakeholders to build support for the program and ensure community participation. Regular updates and addressing concerns raised were some of ways used by Headteachers to promote successful implementation of BEFIT program. Participants highlighted that parents are trained, and they are updated on the importance

of BEFIT program, stakeholders are also updated on the progress and any development on the project.

4.7.3 Infrastructure and resource management

Headteachers ensure that conducive learning spaces are created in classrooms and resources are secured. All concerns of technology are addressed as soon as possible. These include gadget servicing and repair, report on any missing or stolen tools are sent to BEFIT coordinator as soon as possible and deploying security guards with engagement of PTA and other stakeholders for the safety of the gadgets. One respondent explained,

We have by-laws which help us in the implementation of the BEFIT session. For instance, any staff member is not supposed to use the tablets without the consent of BEFIT coordinator. And, teachers and learners are not allowed to take the phones home, once found they will be punished (HT1, 2024).

> *To enhance security of the BEFIT gadgets, the school and other stakeholders deployed a security guard to ensure the safety of the gadgets (DHT1, 2024)*

4.7.4 Sustainability and monitoring

Headteachers focused on long-term sustainability, including securing funding and regularly monitoring and updating the program's progress to relevant stakeholders. According to the (DHT1, 2024) "*I usually check the timetable and follow up if teachers are conducting the BEFIT sessions accordingly".* Headteacher regularly reporting to BEFIT officials on different issues like broken tablet and the problem of Wi-Fi to sustain the program.

4.8 Collaborative environment

4.8.1Teacher development and support

Headteachers promoted teacher training, created opportunities for peer learning, and mentored teachers to improve their confidence in using education technology. Teachers are encouraged by the headteacher to adopt the new era of digital learning and to have a vibrant and enough time, the program is allocated at the end of timetable. Some participants explained that:

> *Instead of distributing the tablets to learners, we let them go outside to wash their hands. They then line up outside the classroom and each learner is given a tablet, USB, and beats. When they occupy their places, the teacher claps their hands as a sign to start and after 30 minutes the teacher claps their hands again to indicate that their time is up (TSS1, 2024)*

> *Teachers are encouraged to work together despite of been in different sections (HSJS2, 2024)*

4.8.2 Gender equity and responsibility sharing

Gender equality and responsibility promotes teachers' teamwork and encourages all section teachers to work together. Teachers are also encouraging to monitor and supervise leaners randomly so that there is equal participation among all members of staff. One participant explained:

> *Every teacher's name is indicated on the duty roster, and it is ensured that everyone follows the duty roster for the session (SHJS2, 2024).*

> *Conducting refresher meeting twice a term to encourage teachers to work hard for the betterment of learners (HT1, 2024).*

I help the head teacher to supervise the work and give feedback to the teacher for the successful implementation of the session (DHT1, 2024).

A conducive environment is establishing for all stakeholders involved including BEFIT officials, leaners, and teachers, to attain a balance willingly shared responsibility among all relevant stakeholders.

4.9 Conclusion

This chapter has presented findings on the adoption and implementation of the Building Education Foundations through Innovation and Technology (BEFIT) in selected public schools in Malawi. It also highlighted critical issues in the research specific objectives. Generally, according to headteachers, teachers and learners interview findings, the integration of BEFIT program has manage to encourage student engagement, professional and knowledge development among learners and teachers. Thus improving leadership and management skills among headteachers in public primary schools.

CHAPTER 5: DISCUSSION

5.0 Chapter overview

This chapter discusses the key findings themes of the study, on the adoption and implementation of the Building Education Foundations through Innovation and Technology (BEFIT) in selected primary schools of Khotakota district in Malawi. Themes were discusses as follows;

5.1. Challenges in the education system

Traditional education system approach centered on teachers as the wilder authority and the student a subject, with no room for other integration (Stambuli, 2023). However, this has been overwhelmed with coming in of free education in primary schools (United Nations, 2015).

5.1.1 Learners engagement and retention Issues

Retention refers to the ability of an institution to keep students enrolled until they complete their studied whilst students engaged refers to the ability of student to persist through challenges and achieve academic success (Shaıbou, 2024; Astin, 1984). Student engagement is multifaceted, involving behavioural, emotional, and cognitive aspects that traditional methods of teaching often fail to address (Kahu & Nelson. 2018). Students are typically required to listen and take notes, with minimal opportunities for interaction, or practical application of knowledge. This method can be particularly disengaging for students who thrive on interaction, collaboration, and hands-on learning. Consequently, there is a growing recognition of the need to adopt more innovative and engaging teaching methods to enhance student engagement and retention (Prince, 2004).

5.1.1.1 Learners absenteeism

Learner's absenteeism is a significant barrier to students' continuous learning. Absenteeism in primary schools is driven by several socio-economic factors, such as financial constraints, family responsibilities, and a lack of motivation to attend school. In particular, students are often

compelled to engage in agricultural or fishing activities to support their families, leading to a diminished sense of importance regarding education. As one headteacher highlighted, "*students there often miss school to work in the fishing industry, leading to disengagement and potential dropouts"* (HT1, 2024; DH2, 2024). In one study conducted by George, (2017), parents with low level of education think their children are source of income, due to this situation they entertain earning little money from their children by being house boy and house girl, some of them engage in other economic activities like farming, animal shepherding. However, educational technologies plays a crucial role in arouse learners‟ interest when using technological tools as specialized tablets (Ozan & Taşgın, 2017).Thus motivating learners to attend school regularly.

5.1.1.2 School dropout

High level of school dropout is closely linked to absenteeism, and results into disengagement and poor academic performance. Students missing school for prolonged periods, find it difficult to catch up with their peers who consistently attend classes. This creates a cycle of failure, where students who are already behind in their studies eventually decide to drop out. However, the introduction of educational technology (e.g., tablets) under the BEFIT program has provided an innovative solution to address these challenges. During an interview with one of the participants said, *"Tablets have sparked interest among learners in lakeshore areas, who previously dropped out to engage in other financial rising activities; like house helpers, now learners have seen the value in attending school to engage with technology"* (DH1, 2024).

In a study conducted in Malawi by Malawi Education Sector Analysis (2019), several factors were identified to contributed to low learning outcomes in Malawi which included; high rate of absenteeism and dropouts by students. It also reviewed that such practices were also identified in

teachers, who would abscond classes. Another study also reviewed that learner's absenteeism in these primary schools were due to lack of parental involvement and, unhealthy relationship between learners and teachers (Mogashoa & Mboweni, 2017).

5.2.1 Educational Technology and Infrastructure

5.2.1.1 Technological and Infrastructure Barriers

The adoption of educational technology has been identified as a necessary step in modernizing the education system in Malawi. As the world becomes increasingly digital, integrating technology into the classroom is no longer optional but essential. The BEFIT program aims to address this need by equipping students with tablets, allowing them to familiarize themselves with technology at an early age. As one respondent explained,

"*Technology is crucial for preparing students for the future, as learners are expected to be familiar with devices such as tablets"* (HT1, 2024).

According to Hennessey *et al.,* (2005), adoption of technology has described a pedagogical evolution among teachers/students as teachers incorporate more technology into their practices. However, adoption of education technology in not a guarantee of education excelling this this also comes at accost; cost of repairing, maintenance and security. One study indicated that high cost for acquisition and maintenance of ICT infrastructure is a challenge that continue to hamper adoption and implementation of ICT in schools (Mutong'wa & Farrel, 2007).

5.2.1.2 Inadequate infrastructure

However, the successful integration of technology in schools depends on overcoming existing infrastructure challenges. One of the most significant challenges is inadequate infrastructure,

which results into overcrowded classrooms and insufficient physical space to accommodate technology. As the introduction of free primary education has led to a dramatic increase in school enrolments, classrooms are now more crowded than ever. This overcrowding has made it difficult for teachers to provide individualized attention to students and has hindered the effective use of technology in the classroom. According to the Malawi Education Sector Analysis (2019), younger students are more vulnerable to loss, time and attention in crowded classrooms. As one deputy headteacher noted:

"*The lack of adequate infrastructure, including new classrooms and facilities, has resulted in an unfavorable teacher-student ratio, further straining the educational process"* (DH2, 2024).

5.2.1.3 Insufficient Tablets

Despite these challenges, the BEFIT program has provided a potential solution through the provision of tablets although they are not enough. Tablets can be used to complement traditional teaching methods and can serve as a valuable tool for self-directed learning. By allowing students to engage with digital content, tablets can bridge the gap caused by overcrowded classrooms and limited teacher capacity.

The second objective of this study aimed to identify the challenges faced by headteachers and other stakeholders during the implementation of the Building Education Foundations through Innovation Technology (BEFIT) program in primary schools. Based on the qualitative data collected from interviews and focus groups with various participants, several significant challenges emerged. These challenges can be categorized into five main themes: professional and knowledge development, student engagement, technological challenges, parents and community engagement,

and gadget-related issues. These challenges have important implications for the effective implementation of the BEFIT program and for the broader education system in Malawi.

5.2 Academic and professional performance

5.2.1 Learning challenges

The issue of low literacy skills remains a significant concern in Malawian primary schools. Many students, especially in rural areas like Nkhotakota, struggle with reading and writing. This issue is compounded by insufficient textbooks, a direct result of the increased enrolment following the introduction of free education in primary schools. The lack of access to adequate reading materials makes it difficult for teachers to provide students with the resources they need to improve their literacy skills. One headteacher pointed out that "*lack of textbooks as a major barrier to teaching effectiveness"* (HT2, 2024). Similarly, low numeracy skills present another challenge for students, especially in the absence of effective teaching methods and adequate resources. The integration of technology through the BEFIT initiative may have the potential to address these gaps by providing interactive, technology-based learning tools that can engage students in literacy and numeracy development. Academic and professional performance is a key milestone for students during educational process, significantly impacting their current circumstances and future opportunities, students who perform well are encourage to further with their education (Kell *et al.,* 2013). According to Godda (2018), the provision of free education in countries like Kenya and Uganda has led to challenges such as unwillingness by parents to contribute financially to schools and increased student enrolment. This has resulted in problems like heavy teacher workloads, teacher shortages, and a lack of adequate instructional materials. This calls for technology integration. This finding is also in line with World Development Report (2018); Imagine worldwide (2024), who also indicated that increase enrolment, inadequate learning resources, low commitment and

engagement of students in school activities are some of challenges faced with traditional education system.

5.2.2 Teacher Quality and Capacity

Another critical challenge is the under qualification of teachers in many primary schools. A significant number of teachers do not have formal training in both tutoring and the use of educational technology. This lack of expertise limits the ability of teachers to integrate technology effectively into the classroom. According to Mogashoa and Mboweni (2017), successful learning requires both teachers and learners to enhance their communication skills. This can be achieved when both parties understand their roles and responsibilities. When teachers and learners are clear about their duties, it promotes the teacher's ability to effectively manage students. Conversely, a lack of understanding or knowledge of these roles do frustrate the learning process. Furthermore, teachers are the key component of primary and secondary education, and their preparation is the foundation for delivering the education programme (Malawi Education Sector Analysis, 2019).

Furthermore, the teacher-student ratio exacerbates the issue, as overcrowded classrooms make it difficult for teachers to provide personalized instruction. Large classes negatively affect teachers' professional satisfaction and enthusiasm of teaching (Blatchford *et al.,* 2003). In response to this challenge, the BEFIT program's use of tablets with instructional guides has been an effective solution. As one headteacher explained, "*the tablets serve as an instructional support system, providing students with structured guidance and reducing the burden on teachers in overcrowded classrooms*" (HT2, 2024).Finally, Rosenberg (2013), indicates that, focusing on how teachers integrate technology into their teaching is more important than focusing on what tool teachers

integrate into their practice. Thus, for effective implementation, teachers must understand how to connect technology with pedagogy and curriculum standards.

5.3 Professional and knowledge development

A key obstacle to the successful implementation of the BEFIT program is resistance from some teachers. Many headteachers noted that teachers were reluctant to embrace change and integrate technology into their teaching, partly due to a lack of incentives and allowances. Some teachers felt the program added extra workload without financial compensation, and one section head pointed out that teachers viewed technology integration as a burden. This aligns with findings from Paschal & Mkulu (2020), which highlighted ongoing challenges in public schools, such as poor student performance, lack of sufficient funds, inadequate teacher's training, hiring and strained teacher-student relationships, despite government reforms aimed at improving education. These challenges frustrate the successful implementation of BEFIT program.

5.3.1 The attitudes of teachers

Teachers' negative attitudes towards the program also played a role in hindering its success. Provision of physical ICT infrastructure alone may not be enough to ensure successful technology integration. Teachers' attitudes towards technology greatly influence acceptance of use of technology in education. This proclamation is supported by a study that Hart and Laher (2015) conducted. They concluded that for technology integration to be successful it was crucial to pay attention to teachers' perceptions of the use of technology in education when integrating technology into schools, as positive attitude of teachers seem to correlate with success of technology integration. As said by one participant:

> *"One headteacher explained that the senior class teachers, in particular, were often unwilling to assist with BEFIT sessions, citing that the program was more relevant for junior class teachers" (DHT1, 2024).*

This resistance and lack of buy-in from staff underscores the need for continuous professional development, motivation, and support to encourage teachers to adopt new teaching practices, including the use of technology in the classroom. Use of tablets in class has frustrated teachers especially those who are not conversant with gadget.

Another respondent stated that:

> "*Tablets shift the focus of learning from the teacher to the technology; a number of learners prefer to learn using technological gadgets than taught by their professional teachers*" *(Respondent TJS2, 2024),*

This assertion may be a contributing factor to the slowing down of the progress of the project. Likely, according to Ravich (2004), the loss of teacher authority has led to the loss of educational standards and weakening of the educational system which they consider an educational crisis.

5.3.2. Learners' engagement

The issue of student engagement emerged as a significant challenge in the implementation of BEFIT. While some students expressed enthusiasm for the use of tablets, others struggled to adapt to this new learning mode. In some cases, students became distracted by the technology, shifting their focus away from their teachers and to the digital devices. One teacher explained

> *"The use of tablets sometimes led to students paying more attention to the technology rather than the teacher, which was counterproductive to the intended learning outcomes" (TJS1, 2024).*

Student engagement or participation is also attributed by the student attitude: the positive the attitude towards something, the more likely he/she will be willing to participate. This statement is supported by study conducted by Jemmott & Jemott, (1991), whose results showed a positive correlation between attitude and use of technology. Consequently, for successful engagement, students need to develop a positive attitude towards the use of technology and in a balance manner, where student to teacher relationship will still be maintained or rather improved (Paschal & Mkulu, 2020).

Additionally, the sharing of tablets among a large number of students posed another challenge. With limited access to devices, students often had to share tablets with their classmates, which made it difficult for teachers to track individual progress and provide personalized feedback. According to Musingafi *et al.,* (2015), students felt institutional challenges, such as inadequate resources, poor infrastructure, and inefficient administrative support, significantly hindered their academic performance and overall progress. This study highlights the correlation between low student engagement and other factors such as insufficient resources (e.g., tablets), limited session time and how this affect student performance

Furthermore, the inclusivity of the BEFIT program was also a concern, as the needs of special education students are not adequately addressed. Students with disabilities, such as those who are deaf, those who cannot speak, or have physical impairments, faced difficulties in operating the tablets, which required extra attention and support from teachers. Inclusive education is defined as

an educational approach that addresses the diverse needs of learners, particularly those facing exclusion due to factors like disability, race, religion, poverty, and psycho-social issues. In this Partnership Compact, inclusion also extends to include girls and children from disadvantaged backgrounds (National Inclusive Education Policy of Malawi, 2016). Studies have verified that there is low access to quality education among learners with special educational needs at all levels. Factors that contribute to this phenomenon include: low capacity of teachers, insufficient materials in schools adapted for effective instruction, lack of infrastructure which is disability friendly and limited investment in assistive device just mention a few (Malawi Education Sector Analysis, 2019). As explained by one of the teachers, with special need student,

> *"Assisting such learners to use the technology is a challenging task, which further strained capacity to effectively implement the program" (TJS2, 2024).*

The lack of tailor-made interventions for special needs children within the BEFIT framework highlights the need for a more inclusive approach to educational technology.

5.3.3. Technological challenge

The implementation of BEFIT also faced several technological challenges, particularly concerning network failures, inadequate gadgets, and technical issues. One of the major barriers was the frequent network failures, which often disrupted the use of digital devices, making it difficult to access educational content. According to eLearning Industry (2016), status of internet access or connectivity is one of the major challenges hampering effective implementation of e-learning or digital learning in Africa. Similarly, one study conducted by Mungai (2011), also identified slow connectivity as one of the major challenges facing implementation of computer education in Kenya. In addition, headteachers and teachers also reported that.

"They are inadequate gadgets due to the large number of students in classes" (TSS2, 2024).

Chen's (2008) study identified external factors such as lack of access to computers and software, insufficient time to plan instruction, and inadequate technical and administrative support that contributed to low uptake of innovation. According to Bayo (2019), technological implementation also carries with it varying degrees of post implementation delay times necessary for training and turn in of the equipment. This is time consuming.

Moreover, the security of the gadgets posed another challenge. Despite efforts to secure the tablets, some devices went missing, resulting in the need for stricter security measures. Headteachers also raised concerns about the repair and servicing of faulty gadgets. The long delays in getting tablets repaired by technicians further disrupted the learning process and created frustration among both teachers and students. One PTA member noted that:

"it took a long time for technicians to respond to repair requests, leading to prolonged periods of inactivity for students" (PTA1, 2024).

The issues with network connectivity and inadequate technical support highlight the need for a more robust infrastructure to support the BEFIT program. To complement with asserted stamen above, Chen (2008), also identified external factors such as limited access to computers and software, insufficient time for instructional planning, and lack of technical and administrative support as key contributors to the low adoption of innovation.

5.3.4 Parents and community engagement

Engagement with parents and the community also emerged as a key challenge in the implementation of the BEFIT program. Some parents were not supportive of the program and continued to prioritize agricultural work over education, encouraging their children to skip school to work on the farms. At the community level, parents are to support children's attendance to school or motivate them (Imagine Worldwide, 2024). One PTA member emphasized that this lack of parental encouragement led to students neglecting their education (PTA2, 2024). The community's role in supporting the program is insufficient, as some community members are indifferent to the importance of the BEFIT program and its benefits.

The misconduct of students in relation to the gadgets, such as stealing and damaging tablets, further compounded the problem. One PTA member explained that they had to intervene when a student was caught stealing a tablet, and the parents had to be held accountable for the child's actions (PTA2, 2024). This reflects the need for stronger community and parental involvement to ensure that students are supported in their educational endeavors and that proper use of the provided technology is encouraged.

5.3.5 Gadget-barriers issues

Finally, the gadget-related issues mentioned by participants in the study were a major concern. Aside from the challenges related to the number of devices and the repair process, the time-consuming nature of operating the technology was also raised as an issue. Some headteachers, teachers, and students felt that the process of setting up and using the tablets was tedious and took up valuable time. This perception of technology being a time-consuming and cumbersome task led to frustration among stakeholders, further contributing to the challenges faced during the program's implementation.

The Implementation of BEFIT has faced several challenges. Key issues include inadequate infrastructure and the need for effective teacher training and ongoing professional development (Ertmer & Ottenbreit-Leftwich, 2010). Resistance to change among educators has hinder adoption (Fullan, 2007),

The third objective of this study was to investigate the strategies employed by headteachers to promote the successful implementation of the Building Education Foundations through Innovation Technology (BEFIT) program in primary schools. Based on the data collected from interviews and focus groups with headteachers, teachers, and other stakeholders, several key strategies were identified. These strategies can be grouped into leadership and management, community and stakeholder engagement, infrastructure and resource management, sustainability and monitoring, and collaborative environment. These strategies reflect a comprehensive approach to ensuring the successful adoption of educational technology in the classroom.

5.4. Leadership and management

Effective leadership and management are crucial for the promotion of the BEFIT program. Headteachers set clear goals aligned with the objectives of the program and ensured that students were regularly trained at the early stages of implementation. This approach helped refresh their knowledge and kept students engaged in the learning process. One headteacher explained that "*early in the process, learners are provided with ongoing training to refresh their brains"* (HT1, 2024). Headteacher ensures that school goals are achieved by reflecting on their attitude towards work, colleagues, and the community. Success relies on teamwork with staff and the community. The primary responsibilities of Headteacher include clarifying the school's purpose, securing

necessary resources, and motivating staff, students, and parents to foster a vibrant school spirit and excellence in performance (Musalia 2005; Paschal & Mkulu, 2020).

In addition to fostering a technology-friendly environment, headteachers played an active role in encouraging student engagement and attendance. Regular meetings with the local community were organized to motivate parents to send their children to school consistently. Headteachers emphasized the importance of education and discouraged students from absconding classes and other activities practiced during school time. As one deputy headteacher mentioned, "*Imagine, other parents take their children to the lake for fishing activities during learning hours. So, we usually condemn such malpractice*" (DHT2, 2024). This proactive approach helped improve student attendance and fostered a more committed school-community relationship.

5.4.1 Community and stakeholder engagement

Headteachers also placed a strong emphasis on community and stakeholder engagement to ensure the success of the BEFIT program. This involved regular communication with parents, local community members, and other stakeholders to build support and ensure active participation in the program. Parents were regularly trained and updated on the importance of BEFIT, while stakeholders were kept informed about the progress and challenges related to the program. Such engagement helped create a sense of shared responsibility, ensuring that the program received the support it needed to thrive. For instance, parents are engaged to play a crucial role in ensuring the safety of school equipment within their communities. Sensitization meetings are also held to explain the intervention and encourage collective efforts to reduce vandalism, theft, and unnecessary loss of school equipment (Imagine Worldwide, 2024). However, despite the effort some parent show resistance to adopt.

Furthermore, the involvement of parents and community members contributed to a more supportive environment for students. Ensuring that parents understood the significance of the program and encouraged their children to participate actively helped increase student involvement and foster a culture of learning within the community.

5.4.2 Infrastructure and Resource Management

One of the key strategies implemented by headteachers was the management of infrastructure and resources to create conducive learning environments. This included securing and maintaining the necessary technological resources, such as tablets, and addressing issues such as gadget repair, security, and theft prevention. One headteacher explained that”

We have by-laws which help us in the implementation of the BEFIT session. For instance, any staff member is not supposed to use the tablets without the consent of the BEFIT coordinator" (HT1, 2024).

This strict adherence to rules and regulations ensured that the resources were used properly and protected from misuse. (DHT1, 2024).

5.4.3 Sustainability and monitoring

For the long-term sustainability of the BEFIT program, headteachers focused on securing funding and monitoring the program's progress. Regular monitoring allowed headteachers to track the implementation of the program and address issues as they arose. For example, one deputy headteacher mentioned,

"*I usually check the timetable and follow up if teachers are conducting the BEFIT sessions accordingly*" (DHT1, 2024).

Additionally, headteachers took on the responsibility of reporting regularly to BEFIT officials about issues such as broken tablets or network problems, ensuring that the program remained viable and sustainable over time. By actively managing and monitoring the program, headteachers could ensure its continued success and make adjustments where necessary. Despite, most responsibility being placed on headteachers In Africa, head teachers are scarcely prepared for their leadership tasks (Bush & Oduro, 2014). Studies in public schools indicates that many leaders have not considered their styles and types of leadership as determinants of teachers‟ job performance in their schools (Ozuruoke *et al.,* 2013). Hence, further pointed out that some of school leaders seem to find it difficult to effectively administer their schools.

5.5 Collaborative environment

5.5.1 Teacher development and support

Headteachers encourage teachers to work together, despite differences in the sections they taught, and to support one another in integrating technology into their lessons. This collaborative approach also included teacher development and peer learning. Headteachers promoted teacher training and created opportunities for teachers to learn from each other, thus building their confidence in using digital tools effectively. Mentoring and peer support helped improve the teaching quality and allowed teachers to become more proficient in the use of educational technology. According to model developed by Gresnigt *et al.,* (2014), teacher commitment, professional development, teacher support, sustained facilities at school level (e.g. funding, schedule) are key element to integrate curriculum. For instance, use of laptops.

Studies have also reviewed that, in order to promote integration of technological learning, teachers need to be associated with technical and pedagogical support (Bao, 2020; Rapanta *et al.*, 2020). According to Femi & Segun, (n.d.), to have seamless transition from face-to-face to digital education, it is essential to consider the technological skills of users. Personnel management, a key area in management, involves overseeing human resources. In this context, school heads, as personnel managers, are responsible for tasks such as ensuring teachers' professional development, motivating staff, promoting and disciplining employees, and appraising their performance.

Furthermore, another collaborative environment can emanate from a teacher to student relationship, according to Dianat and Abedini (2016), for a successful and effective learning to happen, teachers need to be motivated, enthusiastic and engage students. The quality of the relationship amongst a student and the teacher will result in a better degree of learning in the classroom (Downey, 2008). Thus, collaborative environment is vital for productive implementation of BEFIT program. This finding has also been supported by Glickman et al. (2018), who identified collaborative environment within institution, to facilitate teacher's opportunities in reflection, dialogue, and collaboration, all of which are associated with improved teaching and learning.

5.5.2 Gender equity and responsibility sharing

Headteachers also promoted gender equity and responsibility sharing by encouraging equal participation among all staff members. Teachers were encouraged to collaborate and support each other, ensuring that all staff members contributed to the success of the program. A headteacher noted that "*Every teacher's name is indicated on the duty roster and it is ensured that everyone follows the duty roster for the session*" (SHJS2, 2024). This system of responsibility-sharing

ensured that teachers were accountable for their roles in the BEFIT program and that no teacher was left behind in the process.

Additionally, headteachers conducted refresher meetings twice a term to remind teachers of the importance of the program and encourage them to work hard for the betterment of the students (HT1, 2024). This regular check-in helped maintain momentum and foster a sense of shared ownership among teachers, ensuring that they remained committed to the program's success.

5.6 Conclusion

The discussions from this chapter revealed the needful for a collaborative environment among headteachers, teachers and learners to a successful implementation of BEFIT program in primary schools and specific roles that headteacher and all stakeholder need to play, for an improved implementation. This chapter has also revealed how headteachers are at the center of governing the program, for instance, there duty in. engaging all stakeholders to adopt the BEFIT program.

CHAPTER 6: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATISON

6.0 Summary of findings

The strategies employed by headteachers to promote the implementation of the BEFIT program reflect a multifaceted approach that involves strong leadership, effective resource management, and active community engagement. By fostering a collaborative environment, encouraging teacher development, ensuring the sustainability of the program, and creating a secure and conducive learning environment, headteachers played a pivotal role in the success of the BEFIT program. Moreover, the inclusion of gender equity and responsibility-sharing practices further contributed to the program's effectiveness and sustainability. The success of the BEFIT program, therefore, relies heavily on the strategic leadership and management practices employed by headteachers, who ensure that all stakeholders work together towards achieving the program's goals.

6.1 Conclusion

The initiative to integrate technology into primary education highlights both its potential benefits and significant challenges. While it promises to enhance learning outcomes and student engagement, obstacles such as inadequate infrastructure, lack of sufficient teacher training, and unequal access to technology can hinder effective implementation. These factors can affect both students and teacher's outcome/performance if not taken into account.

To promote the integration of innovation further, the Malawi Government should develop a policy on digital learning highlighting critical area of education inclusive (Learners with disability). The policy will govern how e-learning resources are to be developed and in such a way that children with disability can easy operate with little or no assistance from the physical instructors (teachers).

In addition, the government of Malawi should take action to enhance the technology infrastructure in schools by providing funding for the construction or expansion of e-learning resource infrastructure. As findings indicate that provision of tablets alone are insufficient to address the challenges effectively.

Furthermore, BEFIT organization needs to provide adequate training to all involved stakeholders on the usage and proper handling of their gadgets and also to clearly elaborate their aim with areas which they are mandated to intervene. This has been reviewed in cases where teachers felt like the coming in of BEFIT add an extra job on them, which need allowance. And the attitude of some teachers and student who fail to comprehend the sense of ownership.

Further research are needed as project is still on implementation stage, there is a need to investigate how the program intends to include other learners with physical and mentally challenged; such as blindness, defy, dyscalculia and there is need to conduct it on large sample size to have consensus of numerous ideal.

6.2 Recommendations

The study will help the policy makers to be provided with the basis for formulating more policies on measures, improvement and implementation of technological tools in schools

The study will also assist school head teachers to adopt development strategies that will promote good communication and teamwork to provide effective results

The study helped the researcher to contribute fresher knowledge on the benefits of EdTech and challenges faced by head teachers in the implementation of BEFIT programme.

REFERENCES

Akinloye, G. M., & Olaoye, O.F. Adu, E.O., (2014) Internal and external school supervision: Issues,challenges and way forward. *International Journal of Educational Sciences*, 7(2), 269–278, https://doi.org/10.1080/09751122.2014.11890189.

Akinsanya, O., and Oludeyi, S., (2020). *Motivation and productivity at work, in Okafor, E.E., Human Relations Theory: Implications for Effective Human Resource Management*.

Andersson, A., & Grönlund, Å. (2009). A Conceptual Framework for E-Learning in Developing Countries: A Critical Review of Research Challenges. Electron. *Journal Information Systems Developing Countries*, 38, 1–16. https://doi.org/10.1002/j.1681-4835.2009.tb00271.x.

Aparicio, M., Bacao, F., & Oliveira, T. (2016). Cultural impacts on e-learning systems' success. *The Internet and Higher Education*, 31, 58–70. https://doi.org/10.1016/j.iheduc.2016.06.003.

Arkorful, V., & Abaidoo, N. (2014). The role of e-learning, the advantages and disadvantages of its adoption in higher education. *International Journal of Education and Research,* 2(12), 397-410.

Aviles, M., & Eastman, J. K. (2012). Utilizing technology effectively to improve millennials' educational performance: An exploratory look at business students' perceptions. *Journal of International Education in Business*, 5(2), 96-113. https://doi.org/10.1108/18363261211281726

Baker Library. (n.d.). *The Human Relations Movement: Harvard Business School and the Hawthorne Experiments. Harvard Business School*. https://www.library.hbs.edu/hc/hawthorne

Bao, W. (2020). *COVID-19 and online teaching in higher education: A Case Study of Peking University. Human Behaviour and Emerging Technologies*, 2(2), 113–115. https://doi.org/10.1002/hbe2.191.

BETIT Report, (2022). *Building Education Foundations through Innovation and Technology. Malawi Scale-up Program Overview*. https://www.imagineworldwide. org/upgrade. General Ovverview-9-6-23

Bull, G. Thomson. (2016). *Evaluating the impact of educational technology: Journal of digital learninginteachereducation*

(32(4),(pp.117118)https://doi10.1080121532974.2016.121705

Bratton, J., & Gold, J. (2017). *Human resource management: theory and practice*. Palgrave

Black, J.S.& Bright, D. S.(2019). *Organizational Behavior. OpenStax.* https://openstax.org/details/books/organizational-behavior

Cifuentes, L., Maxwell, G., & Bulu, S., (2011). Technology Integration Through Professional Learning Community. *Journal of Education Computing Research* 44 (1) 59–82 [9]

Cohen L, Manion L, and Morrison K, (2018). *Research methods in Education* (8th edition). London: Routlege.

Cowie, K. B., (2019) *Leadership in Technology Education Curriculum Matters* 3 176 [16].

Chang,H., (2011) .*The Effect of Principals Technological Leadership on Teachers TecnologicaLiterascy and Teaching Effectiveness in Taiwanese Elementary Educational Technolgy & Society* 15 (2) 328–340 [14].

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.

Creswell, J. W. (2014). *Research design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Sage.

Creswell, J. W., & Clark, V. L. P. (2011). *Designing and Conducting Mixed Methods Research*. (2nd ed). Sage Publications, Los Angeles.

Davis, F. D., (1985). *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results* (Wayne State University) [12]

Dexter, S., (2011). *School Technology Leadership; Artifacts in Systems of Practice Journal of School Leadership* 21 (3) 166–189 [7]

Doughty.H.A., (2020). *What is Universal Education Ethical Challenges in challenges in Higher Education in Leadership and Administration* https://doi:10.1018/ 978-1-7008-4141-8.

Eren, E. S. & Kurt, A. A., (2008). *Technological Leadership Behavior of Elementary School Principals in The Process of Supply and Use of Educational Technologies Education 131*

George, I.N., Sakirudeen, A.O. and Sunday, A.H., (2017). Effective classroom management and students'academic performance in secondary schools in Uyo local government area of Akwa Ibom state. *Research in Pedagogy*, 7(1), pp.43-56. (3) 625–636 [15]

Evans. D.K., Akmal. M., and Jakiela. P., (2020). *Gender Gaps in Education: The Long View-Center for Global Development* https://www. Cgdev. Org.>files

Gibbs, G.R., (2007). *Thematic coding and categorizing. In E. Flick (Ed.), Analyzing qualitative data.*Thousand Oaks, CA: Sage Publications

Grant, C. & Osanloo, A., (2014). *Understanding, Selecting, and Intergrating Theoretical Framework in Dissertation Research: Creating the Blueprint for your „House"* doi:10.5929/2014.42.9

Hashim, H., & Tasir, Z. (2014). E-Learning Readiness: A Literature Review.

International Conference on Teaching and Learning in Computing and Engineering. 267-271. https://doi.org/10.1109/latice.2014.58

Hubackova, S., (2014). *Pedagogical foundation of elearning. Procedia-Social and Behavioral Sciences,* 131, 24–28. https://doi.org/10.1016/j.sbspro.2014.04.073

Hubackova, S., (2015). *History and perspectives of elearning. Procedia-Social and Behavioral Sciences,* 191, 1187–1190. https://doi.org/10.1016/j.sbspro.2015.04.594

Hussein, I., (2010). Measuring students e-readiness for e-learning at Egyptian faculties of tourism and hotels. *Journal on Efficiency and Responsibility in Education and Science,* 3(1), 28-35

Ikwuka, N.O., (2016). Understanding Strategic Human Resource Management. *Human Resource Management Journal*. 8 (1) 75-84

Johari, A.M.Y.,Ghani, M.F.A., Radzi, N.M., Ayub, A., and Ghani, M.A. (2023). Challenges of school leaders' digital leadership: An initial study in Bintulu, Sarawak, Malaysia. *Journal Akuntabilitas Manajemen Pendidikan.* 1*(5)* 234-241

Kell, H. J., Lubinski, D., & Benbow, C.P., (2013). Who Rises to the Top? Early Indicators. *Psychological Science*.doi.org/10.21831/jamp. v11il.5844

Kivunja, C., (2017). *Understanding and Applying Research Paradigm in Educational Contexts*: https://doi.org/10.5430/ijhe.v6n5p26

Kharkiv. S.H.S., (2023). Educational Challenges. National Pedagogical Unified. *Electronic Scientific Journal*. ISSN 2709-7986. Doi:10, 34142/2709-7986

Lazaro, H., (2020). *What is edtech and why it matters to you? General Assembly Blog.* Retrieved https://generalassembly/blog/what-is-edtech

Levin, B. B.& Schrum, L., (2013). Using Systems Thinking to Leverage Technology for School Improvement: Lessons Learned from Award-Winning Secondary Schools/Districts. *Journal of Research on Technology in Education* 46 (1) 29–51 [8]

Mayo, E. (1933). *The human problem of an industrial civilization.* New York, NY: Macmillan

Means, B., (2010) *Technology and Education Change: Focus on Student Learning Technology and Education Change* 42 (3) 285–307 [10] Indrajit R E n.d. Manajemen Sistem Informasidan Teknologi Informasi (Jakarta: PT Elex Media Komputindo)

Mogashoa, T. and Mboweni, L., 2017. *Challenges and factors contributing to learner absenteeism in selected primary schools in Bohlabela district of the Mpumalanga Province. Journal of Educational Studies,* 16(1), pp.21-33.

Molokanova, V. M., (2017). *Organization development project management in the system of synergetic knowledge Metallurgical and Mining Industry* 1 (1) 14–2.

Mkandawire, M. (2020, April). *Airtel, TNM facilitate e-learning for students in Malawi*. Malawi24.https://malawi24.com/2020/04/21/airtel-tnm-facilitate-e-learning-forstudents in Malawi.

Negulescu, O. & Doval, E., (2014). *The quality of decision making process related to organizations" effectiveness Procedia Economics and Finance* 15 (14) 858–863 [5]

Ngole, D. M., and Mkulu, D, G., (2021). *The Role of School Heads' Supervision in Improving Quality of Teaching and Learning: A case of Public Secondary school in Ilemela District Mwanza.*

Tanzania Department of Educational Foundation, n.d. St. Augustine University of Tanzania, Mwanza, Tanzania, *Mwanza journal* DOI: 10.22161/ijels https://creativecommons.org/licenses/by/4.0/

Nyirenda, M.K., (2021). Impact of Resource Distribution and Availability on Primary Schools Pupil Learning Outcomes: Case Study of Chintheche Education Zone, Nkhata Bay, Malawi. *Journal of Development and Communication Studies*, 8(1) 239 - 260 https://dx.doi.org/10.4314/jdcs.v8i1.12

Omolawal, S.A., (2016). Leadership and Management-Subordinates Nexus for Positive Organisational Outcomes. *Human Resource Management Journal*. 8(1):85 https://orcid.org/0000-0002-8023-5306.

Paloyo.Alfredo. R., Rogan, Sally., and Sininster, Peter (2016). The effect of Supplemental Instructiomon academic performance: An encouragement design experiment. *Economics of Education Review* doi:10,1016/j, econedurev. 2016. 08.005 Issn 0272-7757s2CID 39887209-via Elsevier

Paschal, M.J. and Mkulu, D.G.,9 2020.) *Teacher-students' relationship and students' academic performance in public secondary schools in Magu District*, Tanzania.

Paschal, M. J., and Mkulu. D. G., (2020). *Teacher- Students' Relationship and Students 'Academic Performance in Public Secondary Schools in Magu District, Tanzania. Journal of Research in Education and Society*, 11(1), 20-3. http://www.icidr.org/jresv11no1- content.php

Pervin, N., and Morkhtar, M. (2022). The Interpretivist Research Paradigm: A Subjective Notion of a Social Context. *International Journal of Academic Research in Progressive Education and Development*.

Rubin, A., and Babbie, E. (2014). *Research methods for social work (8th ed.). Belmont, California:* Brooks/Cole Cengage Learning.

Sagbas, M., & Erdogan, F. A. (2022). *Digital Leadership: A Systematic Conceptual Literature Review. İstanbul Kent Üniversitesi İnsan ve Toplum Bilimleri Dergisi*, 3(1), 17-35. https://www.researchgate.net/publication/358729671_DIGITAL_LEADERSHIP_A_SYSTEMATIC_C ONCEPTUAL_LITERATURE_REVIEW

Scott, G.,(2003). *Effective Change Management in Higher Education Educause Review* 38 6480

Shaıbou A.H. (2024) *Strategies to Enhance Student Engagement and Retention in Higher Education Learning Environments, British Journal of Multidisciplinary and Advanced Studies,* 5(5),13-31

Sheninger, E. (2019). *Digital leadership: Changing paradigms for changing times*. Corwin Press.

Starkey, L., & Eppel, E. (2019). *Digital data in New Zealand schools: Policy reform and school leadership.Educational Management Administration & Leadership*, 47(4), 640- 658. https://doi.org/10.1177/1741143217745881

Stark, D., McGhee, M. W., & Jimerson, J. B. (2017). Reclaiming instructional supervision: Using solution-focused strategies to promote teacher development. *Journal of Research on LeadershipEducation*. 2(3),215–238. https://doi.org/10.1177/1942775116684895

Schiuma, G., Schettini, E., Santarsiero, F., & Carlucci, D. (2021). The transformative leadership compass six competencies for digital transformation entrepreneurship. *International Journalof Entrepreneurial Behavior& Research*. ://doi.org/https://doi.org/10.1108/IJEBR-01-2021-0087

Schmid, R., Pauli, C., & Petko. D. (2023). *Examining the use of digital technology in schools with a school-wide approach to personalized learning. Education Tech Research Dev* (2023) 71:367-390https://doi.org/10.1007/s11423-022-10167.

Todd, M. J., (1960). *21st Century Leadership and Technology Journal of Management in Engineering* 2 (1) 40–49 [6]

Thorn, C. A. (2001.) *Knowledge Management for Educational Information Systems Education Policy Analysis Archives* 9 (47) 47 [3]

Twinning, P., Heller, R.S., Nussbaum, M., & Tsai, C.-C. (2017). *some guidance on conducting and reporting qualitative studies. Computers and Education,* 106, A1-A9.

https://doi.org/10.1016/j.compedu.2016.12.002

Uğur, N.G. & Koç., T. (2019). Leading and Teaching with Technology: School Principals‟ Perspective. *International Journal of Educational Leadership and Management*, 7(1), 42-

71. DOI: 10.17583/ijelm.2018.3758 UNESCO (2015) Global citizenship education: topics and learning objectives. http://unesdoc.unesco.org/images/0023/002312/231288e.pdf Google Scholar.

UNICEF. (2019). 2018/19 *Education Budget Brief: Towards Improved Education for All in Malawi. United Nations Children's Fund*. Malawi: Lilongwe.

United Nations. (2015). *Sustainable Development Goals:17 Goals to Transform, Our World*.

Vancouver, J.B. (1996). *Living systems theory as a paradigm for organizational behaviour:*

Understanding, humans, organizations and social processes. Retrieved from:

https://www.researchgate.net/profile/Jeffrey_Vancouver/publication/14348397.

Venkatesh, V., Jedwab, J., Rabah, J., Thomas, T., Varela, W., & Alexander, K. (2013). *From disconnected to connected: Insights into the future of distance education and web 2.0 tools in higher education*. Revue internationale des technologies en pédagogie universitaire, 10, 6–13. Doi:10.7202/1035575ar.

Wagner, A, D. (2001) *IT and Education for the Poorest of the Poor: Constraints, Possibilities, 138and Principles*. TechKnowLogia, July/August, 48-50.

Wang, Q., Woo, H. L., & Zhao, J. (2009a). *Investigating critical thinking and knowledge construction in an interactive learning environment. Interactive Learning Environments,* 17(1), 95–104.

Wang, Q. (2009). *Design and evaluation of a collaborative learning environment. Computers and Education*, 53(4), 1138–1146.

Wang, Y. S., Wu, M. C., & Wang, H. Y. (2009b). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, 40(1), 92–118.

Wickham, H., Cook, D., & Hofmann, H. (2015). Visualizing statistical models: Removing the blindfold. Statistical Analysis and Data Mining: *The ASA Data Science Journal*, 8(4), 203-225.

Weidlich, J., & Bastiaens, T. J. (2018). Technology matters – The impact of transactional distance on satisfaction in online distance learning. *The International Review of Research in Open and Distributed Learning*, 19(3). https://doi.org/10.19173/irrodl.v19i3.3417.

Zawacki-Richter, O., Müskens, W., Krause, U., Alturki, U., & Aldraiweesh, A. (2015). Student media usage patterns and non-traditional learning in higher education. *The International Review of Research in Open and Distributed Learning*, 16(2), 136–170. https://doi.org/10.19173/irrodl.v16i2.1979.

Zawacki-Richter, O., & Naidu, S. (2016). *Mapping research trends from 35 years of publications in Distance Education. Distance Education*, 37(3), 245–269. https://doi.org/10.1080/01587919.2016.1185079.

Ziegler, M., & Hagemann, D. (2015). Testing the Unidimensionality of Items: Pitfalls and Loopholes. *European Journal of Psychological Assessment*, 31(4), 231–237. doi:10.1027/1015-5759/a000309.

Zhao, Y., Lei, J., Yan, B., Lai, C., & Tan, H. S. (2005). *What makes the difference? A practical analysis of research on the effectiveness of distance education. Teachers College Record*, 107(8), 1836–1884. https://www.un.org.sustainabledevelopment.

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

Wright, G. A., (2008) *Improving Teacher Performance Using an Enhanced Digital Video Reflection Technique International Conference of Congition and Exploratory Learning in Digital* Afge 381–385 [17]

Zhang, L., Basham, J.D., and Yang,S.,(2020). Understanding the implementation of personalized learning: A research synthesis. *Educational Research Review*, 31,100339. https://doi.org org/1016/j.edurev.31,100339.

Zhong, L. (2017). Indicators of digital leadership in the context of K-12 education. *Journal of Educational Technology Development and Exchange* (JETDE), 10(1), 3. https://doi.org/10.18785/jetde.1001.03/.

Zhu, P. (2015). *Digital master: Debunk the myths of enterprise digital maturity.* Lulu Press.

APPENDICES

Appendix 1: Interview guide for headteachers

1. How often do you use technology for information presentation at your school?

   .....

2. What is your understanding on the concept of educational technology?

   .....

3. What sort of training did you undergo before befit program?

   .....

   Prompt 1: Do you think the training was enough to implement the project?

   .....

   Prompt 2: Share the knowledge instructed from that training

   .....

4. Do you think the use of technological tools (tablets) enhance learning?

   .....

   Prompt 1: if yes, justify your answer

   .....

   Prompt 2: if no, please justify

   .....

5. What do you think are the factors that led to the implementation of BEFIT program?

   .....

6. What was the performance before the BEFIT program?

   .....

7. Do you think this program has changed the way teachers taught before?

   .....

   Prompt 1: What is the attitude of teachers while using the tablets?

   .....

   Prompt 2: What about the learner's attitude?

   .....

8. What further support do you receive in the implementation of BEFIT program from the following stakeholders;

   PTA members. Do they show any interest in the implementation of BEFIT program?

   Prompt 1: if yes, how do they help you?

   Prompt 2: if not, why do you think they are not helping?

   Parents: do they support you? Do they encourage their children to attend classes?

   Prompt 1: if yes, what kind of support do they give you?

9. Did you allocate the program of BEFIT on the timetable?

   .....

   Prompt 1: if yes, how did this affect the master timetable?

   Prompt 2: if not justify your answer

10. Do you supervise the teachers work on the usage of tablets when teaching?

    .....

    Prompt 1: Do you give feedback to your teachers?

    .....

    Prompt 2: Is there any motivation given to these teachers for using these digital tools?

    .....

11. Are there any challenges you face during the implementation of BEFIT program?

    .....

    Prompt: If yes, please give examples.....

12. Do you receive further support from the BEFIT officials?

    .....

13. What are the effective strategies which you are using to promote the implementation of BEFIT program? .....

    Prompt: If yes, mention them.

    .....

14. In your opinion, do you think digital tools are important in teaching and learning?

    .....

15. Are the BEFIT tablets adequate for the learners here at your school?

    .....

    Prompt 1: Do you allow them to take at home? .....

    Prompt 2: How do you care for these tablets from damaging and being stolen?

    .....

16. Is there any policy that guides the use of BEFIT tablets in schools?

    .....

    Prompt 1: If yes, please share your knowledge.

    .....Pro

    mpt 2: If no, how do you guide all the stakeholders in the use of tablets to promote basic education? .....

17. In your opinion, what do you think your fellow headteachers must do to produce high quality results of numeracy and literacy skills in primary schools?

.....

Thankyou

Appendix 2: Observation Guide Structures for Implementing BEFIT

How best is the school able to:	**Excellent**	**Good**	**Average**	**Needs support**
1. Classroom arrangement and organization structure for BEFIT‟s lesson				
2. give adequate teaching and learning resources. In this case, learners provided with enough tablets				
3. The use of effective teaching and learning strategies				
4. time allocation, do they have enough time when using tablets				
5. provide enough classroom for conducive teaching and learning using tablets				
6. punctuality, do they observe time as they come from healthy break				

Appendix 3: Interview guide for teachers' focus group

1. How many years have you taught as a primary school teacher? .....

   Prompt 1: how many years have you taught using the educational technology tools?

   ……

   Prompt 2: what is your understanding on the concept of educational technology?

   …….

2. Do you think the use of technological tools have advantages for teaching and learning?

   Prompt 1: if yes; mention them…….....

   Prompt 2: if your answer is no; please, justify your answer……

3. How many learners do you teach in your class?

   Prompt: are the tablets enough for the learners?

4. What is the level of your learner's experiences on the use of these tablets?

.....

Prompt: how do you assist those who have little experiences?

.....

5. What is your understanding of numeracy and literacy? And what was learner's performance before the digital era?

.....

6. For how long have you been using EdTech tools for teaching and learning especially on numeracy and literacy?

.....

Prompt: what is the attitude of learners while using EdTech tools?

.....

7. Do you like using these tablets for teaching and learning?

……...

Prompt 1: how confident are you when using these tablets for teaching and learning?

.....

Prompt 2: Do you think the EdTech have changed the way teachers teach?

.....

Prompt 3: In what ways? Justify

……

8. What sort of challenges do you face when conducting BEFIT session?

.....

9. What specific activities or tasks do you give learners after your lesson delivery in numeracy and literacy lesson?

.....

10. What are the strategies do you use when using BEFIT tablets in the classroom?

.....

Prompt: which ones do you think are effective that can promote numeracy and literacy skills?

11. What sort of training did you undergo before using the technological tools?

Prompt 1: do you think the training was adequate?

.....

Prompt 2: if yes, what made you to think so?

.....

Prompt3: if no, for how long do you think the training could have taken?

.....

12. In your own opinion, do you think these BEFIT tablets are enhancing numeracy and literacy skills among learners?

.....

13. What also do you think teachers must do to produce high quality results of numeracy and literacy in public primary schools?

.....

Thank you

Appendix 4: Data analysis procedures

Table 5: Steps in thematic analysis

	STEPS	REMARKS
1	Transcription	After the interviews, all scripts/audio recording where transcribed verbatim
2	Familiarisation	The transcribed data was thoroughly read to familiarise with it and ensure that it faithfully reflected the content of the interviews. The document was further cleaned by deleting words that were unnecessary.
3	Generating initial codes	After ensuring that all the transcriptions were accurate, we read and re-read the entire data to understand it better, searching for meanings and patterns. We then began the process of initial coding
4	Searching for themes	After the initial coding, codes were grouped into potential themes, which were then refined by ensuring that there was a coherent pattern in each of the themes
5	Defining and naming themes	Themes are then defined, identifying and telling a story for each theme. sub themes/categories were also generated in each of the themes, gave the themes working titles and described their content
6	Producing the report	This stage began when themes are fully generated, it involved the final analysis and write-up of the report in a manner that would make sense to the readers