Investigating the Usefulness of Interactive Tablets in Facilitating Teaching and Learning Activities: The case of Mwabu Tablet

By

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A dissertation submitted to the University of Zambia in partial fulfilment of the requirements for the award of the Degree of Master in Library and Information Science

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DECLARATION

I, Kadeyo Mutale Kuyela, do hereby declaring that this dissertation entitled; "Investigating the Usefulness of Interactive Tablets in Facilitating Teaching and Learning Activities: The Case of Mwabu Tablet" is my original work and has not been submitted to any institution before. All sources used have been thoroughly acknowledged.

Signed (Candidate)...   Date…………………. 2022

CERTIFICATE OF APPROVAL

This dissertation by Kadeyo Mutale Kuyela has been approved as partial fulfilment of the requirements for the award of the Degree of Masters in Library and Information Science by the University of Zambia.

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ABSTRACT

In recent years, pupils and educators alike have utilised new technologies such as interactive tablets as a means of enhancing the learning process and teaching. The use of interactive tablets in the classroom has enriched pupils' interactive and collaborative activities by enhancing classroom engagement and assisting pupils in a variety of instructional content and applications for learning and teaching. The purpose of the study was to investigate the usefulness of Mwabu interactive tablets in facilitating teaching and learning activities in eight selected private primary schools of Lusaka District. The study employed Technology Acceptance Model-2 (TAM2) theoretical framework to establish the usefulness of the Mwabu interactive tablet in facilitating teaching and learning activities. A survey research design was used to collect quantitative and qualitative data from a sample of 208 participants who included 64 teachers and 144 pupils. Simple random sampling was used in the study to select pupils while purposive sampling was adopted for teachers. Data collection tools included structured questionnaires and observation methods. Data was analysed using Statistical Package for Social Sciences (SPSS) and content analysis was done on qualitative data. The findings of the study revealed that 27 (47.4%) teachers were using the Mwabu interactive tablets often for reading and listening to books and 47 (18.0%) pupils were using the Mwabu interactive tablets for taking quizzes. The study also established that the Mwabu interactive tablet had integrated teaching and learning materials for teachers and pupils. The majority of the respondents whose mean was 4.3158 agreed that they had the intention to use the Mwabu interactive tablet. The study established that 23 (40%) teachers agreed that the Mwabu interactive tablet was useful in facilitating learning activities and 49 pupils representing (44%) strongly agreed that the Mwabu interactive tablet was useful in facilitating learning activities. Therefore, the study recommended that schools should ensure that teachers and pupils should make use of the Mwabu interactive tablet in schools and this can be done through awareness activities and training. School managers should encourage parents/guardians to buy Mwabu interactive tablets for their children so that pupils can even use them at home.

Keywords: *Perceived Usefulness, Perceived Ease of Use, Subjective Norm, Voluntariness, Image, Intention to Use, Job relevance, Output Quality, Result demonstrability, iSchool Company, Mwabu interactive tablet, Application software, Tablet PC, and Ministry of General Education*

DEDICATION

This work is dedicated to my adorable wife Chipo Kuyela Chembo, my mother Anastasia Mutale Kuyela, my son, Daniel Lupalo Mutale Kuyela, my brother, Pascal Mutale Kuyela, my sister Memory Mutale Kuyela, my nephews, Simeo and Nathan Kuyela and my Uncle Francis Kuyela for their support during the period of writing this dissertation.

I will always be grateful for their love, inspiration, and encouragement in the deepest hours of the need of my social and academic endeavours', which have seen me this far.

May God bless you all!

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ACRONYMS AND ABBREVIATIONS

ASD	:	Autism Spectrum Disorder
BEC	:	British Educational Communication
BECTA	:	British Educational Communications and Technology Agency
FNDP	:	Fifth National Development Plan
ICT	:	Information and Communication Technology
ISP	:	Internet Service Provider
JR	:	Job Relevance
MO	:	Microsoft Office
MOGE	:	Ministry of General Education
OQ	:	Output Quality
PC	:	Personal Computer
PDF	:	Portable Document Format
PEU	:	Perceived Ease of Use
PU	:	Perceived Usefulness
RD	:	Result Demonstrability
SN	:	Subjective Norm
SPSS	:	Statistical Package for the Social Sciences
TA	:	Technology Agency
TAM-2	:	Technology Acceptance Model - 2
UNZA	:	University of Zambia
ZICTA	:	Zambia Information and Communications Technology Authority

CHAPTER ONE: INTRODUCTION

1.1 Overview

This chapter presents the introduction of the study on the usefulness of interactive tablets in facilitating teaching and learning activities. The first part covers the background of the study explaining the integration of Information and Communication Technologies (ICTs) in education. The chapter also presents the statement of the problem, the purpose of the study, specific objectives, research questions, and significance of the study, theoretical framework, and definition of key concepts. The last section is the summary of the chapter.

1.2 Background of the Study

Education is considered the basis for development in every society. The development of any country depends largely on the quality of education and Zambia is no exception. Modern education is not restricted within the classroom. The recent development of information and communication technology (ICT) has brought out the whole world outside the classroom. Information and Communication Technology plays a crucial role in this respect. It is treated as an integral part of educational reforms and innovations at primary schools, secondary schools and at the tertiary level (Mondal & Roy, 2010). Asabere and Enguah (2012) postulates that ICT can broadly be defined as the resources and equipment that provide the required environment with the physical infrastructure and the services for the generation, transmission, processing, storing, and dissemination of information in all forms including voice, text, data, and graphics.

These technologies include computers, the Internet, e-mail, Personal Computer (PC), Mobile phone, wireless sets, projectors, interactive boards, broadcasting technologies (radio and television, and different interactive boards. Thus, ICTs are systems that gather different information or data to communicate over some distance with the help of modern technology. ICT is not only the backbone of the information age but also an important catalyst and tool for inducing educational reforms that change our pupils into productive knowledge workers (Paul & Mondal, 2012).

ICTs are also a medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, simulations, and educational networks (Jonassen, 2000). Technology can help educators create blended learning

environments and leverage on digital tools for formative and summative assessments, bringing new models for teaching and learning to classrooms. Technology in education and the right devices in pupils' hands help prepare them with the career and technical skills they need to be successful. Ogunlade (2015) similarly noted that pupils are aware that ICT resources can enhance course delivery and facilitate independent and self-governing learning by learners and enhance self-development and self-improvement for the teacher. The use of ICT resources in the teaching-learning process is needed to attract pupils' attention and to make teaching-learning activities more interesting and also effective. This has made it vital that pupils not only need to use ICT, but they need to become comfortable with it.

The integration of ICTs in the classroom is getting more important as it helps pupils in enhancing their collaborative learning skills as well as developing transversal skills that stimulate social skills, problem-solving, self-reliance, responsibility, and the capacity for reflection and initiative. All these elements are core values that pupils need to achieve in an active teaching and learning environment (Ghavifekr, 2014). Adeosun (2010) notes that the use of ICT in education improves the quality and the quantity of education and causes better innovative, creative, and cognitive thinking, higher productivity, efficiency, and educational outcomes. For instance, the Malaysia government had implemented the integration of ICT in the learning and teaching process in the early 1970s (Marshall, 2007). This is due to the importance of technology-literacy which produces a critical thinking workforce to face and involve the country in the global economy.

In Zambia, the government has demonstrated the importance of ICTs in education by incorporating them in the Fifth National Development Plan, 2006-2010 (Mulima, 2013). The Ministry of General Education endeavours to integrate ICT in teaching and learning at all levels. This is in a bid to improve the quality of the education delivery system and provide support to alternative electronic stand-alone or distance education systems (Grace, 2004).

An interactive tablet is one tool that has enabled the integration of ICT in education. This has been recognised by the project of AfriConnect Development, an Internet Service Provider (ISP) (Khosla, 2013). AfriConnect started in 2007 with investment in the development of the concept of the interactive tablet to promote e-learning. E-learning is defined in many ways. One of its most common definitions is that it is a tool to enhance learning and teaching experience through the utilisation of digital media or information communication technologies like laptops, computers, and tablet computers. (Al-Doub, Goddwin, Al-

Hunaiyyan, 2008). Markus (2008) also defined e-learning as a learning process created by interaction with digitally delivered content, network-based services, and tutoring support. Teachers also use e-learning for convenience so that materials are easily shared with their pupils and that outputs are easily sent to the teacher (ibid).

An interactive tablet is defined as a general-purpose computer touch screen panel that is operated and interacted primarily with the finger or a stylus (Brandrick, 2010). He further outlines the features of interactive tablets which are: mobility, lightweight, ability to run common programmes, ability to adapt different screen orientations (landscape or portrait), ability to write or draw on the screen, and ability to be networked.

Since their arrival, interactive tablets have become one of the latest technological trends in everyday life and classrooms (Savas, 2014). However, their use and usefulness in primary schools especially in the developing world is not wide spread (ibid). This is because people in the developing world, more often have no access to the technology needed to engage in learning (Grace, 2004). Using tablets for teaching and learning generates a pedagogically unique learning experience based on the principles of enhancing the personal motivation of each student, self-choice, and independent and shared initiatives for implementing one's studies.

According to Kangwa (2011), most of the Zambian private primary schools use the Mwabu interactive tablet, which is a complete e-learning system and is centred on providing lesson plans for teachers and online interactive multimedia learning content for pupils. The Mwabu interactive tablets aim to improve the standard of education in Zambia by increasing access to quality education and teacher materials and also the poor in urban areas where internet connectivity is relatively widespread as well as problems which are compounded by a shortage of trained teachers (Petko & Cantieni, 2017). Mweetwa (2016) says that the Mwabu interactive tablets are designed for pupils and teachers to use the tablets every other lesson using a specially developed system that enables the teacher to organise a class into groups and work with each group on a rotation basis. They work very well for larger class sizes and ensure that a teacher can work more closely with each pupil.

Mwabu's subsidiary, iSchool, was founded in Zambia in 2010 and was amongst the earliest developers of educational content on tablet devices (Mweetwa, 2016). Over 40,000 licenses of comprehensive, curriculum-aligned content have been distributed in 50 schools in Zambia,

where it is used by parents and teachers in thousands of homes and community, private and government schools. Mwabu interactive tablets are designed to improve the quality of teaching and learning in ordinary classrooms across Africa (Kangwa, 2011). This depends on ensuring that lessons are well planned, that teaching moves away from traditional "chalk-and-talk" and those pupils learn through engaging in a range of different ways. Mwabu interactive tablet lessons require pupils to read in every lesson, at a level appropriate to their age. Lessons are also vocalised, and children's learning is enhanced by simultaneously following text and hearing.

Mwabu interactive tablet content does not replace face-to-face teaching with e-learning, but supports classroom activities by providing comprehensive lesson plans and interactive (Mweetwa, 2016). The material helps to broaden the range of pedagogical methods available to teachers while driving engagement and greater understanding among learners. Mwabu interactive tablet contents cover primary school curricula. The goal of the interactive tablet is to enable children from all backgrounds to realise their right to high-quality education and to equip them to access new opportunities that will drive the development of the continent

1.3 Statement of the Problem

The evolution of Information and Communication Technologies (ICTs) has led us to this digital world we live in, where an increased number of people have access to mobile devices such as interactive tablets that have improved educational outcomes tremendously. Therefore, the government of Zambia visualises a country transformed into an information and knowledge-based society and economy, supported by consistent development and prevalent access to ICTs by all citizens in the year 2030 (Kangwa, 2011). As a result, the ICT policy concerning education aims at integrating Mwabu interactive tablets in the education system and this can be seen by the Zambia Information and Communications Technology Authority (ZICTA) which has partnered with iSchool Zambia in a project that aims to empower primary schools through the supply and installation of digital content on tablet computers (iSchool Zambia, 2013). The use of the Mwabu interactive tablets has enabled pupils and teachers to have the chance to read books and discern knowledge. Despite the Mwabu interactive tablet being on the Zambian market for some time, there have been no studies done to review the usefulness of the Mwabu interactive tablets on the Zambian education system. Therefore, the study is aimed at investigating the usefulness of Mwabu interactive tablets in facilitating teaching and learning activities in private primary schools in Lusaka district.

1.4 Purpose of the Study

In light of the background above, the purpose of the study was to investigate the usefulness of Mwabu interactive tablets in facilitating teaching and learning activities in the selected private primary schools of Lusaka District.

1.5 Specific Objectives

The specific objectives of the study were:

i. To explore how the Mwabu interactive tablets are being utilised by teachers and pupils,

ii. To establish the teaching and learning materials integrated with the Mwabu interactive tablet,

iii. To examine the perceived usefulness of teaching and learning materials integrated with the Mwabu interactive tablet.

1.6 Research Questions

This study was guided by the following research questions:

i. How are the Mwabu interactive tablets being utilised by teachers and pupils?

ii. How are the teaching and learning materials integrated with the Mwabu interactive tablets?

iii. What is the perceived usefulness of the Mwabu interactive tablets on teaching and learning?

1.7 Significance of the Study

The topic is relevant not only to the field of Library and Information Science but also to Information and Communication Technologies (ICTs) and Education. This study has substantially contributed to knowledge on the use of (ICTs) as the Mwabu tablets in teaching and learning in Zambia. The study is an eye-opener to the schools and the Ministry of Education in Zambia on the need to integrate ICTs into teaching and learning in schools. This study should be of interest to early education professionals, as the issue of tablet

implementation in primary school will impact the instruction that takes place on a daily basis. The impact will be felt in how teachers design their lessons, arrange classroom environments, or challenge themselves to find new ways to prepare their children for the 21st century McManis, 2012)

1.8 Limitations of the Study

Notable limitation to the study was that some information from respondents was not released to the researcher promptly due to ethical issues since the respondents demanded ethical clearance before such information could be released. The other limitation was that the study only concentrated on private primary schools that were in Lusaka district alone. Geographically the schools were far apart; hence a lot of time was spent when moving from one school to another. In as much as the limitations were there, the study can also be done in public schools.

1.9 Theoretical Framework

A theoretical framework offers several benefits to research study. This is because it provides the structure upon which a researcher may define his/her work philosophically, epistemologically, methodology and analytically (Grant & Osanloo, 2014). A theoretical framework for this study was anchored on the Technology Acceptance Model-2 (TAM-2) theory which provided a guideline on the usefulness of interactive tablets in primary schools.

TAM-2 is an information systems theory that models how users come to accept and use technology (Venkatesh, 2000). The model suggests that when users are presented with new technology, several factors influence their decision about how and when they will use it. These factors are perceived usefulness of the system, perceived ease of use of the system, intention to use, and usage behaviour.
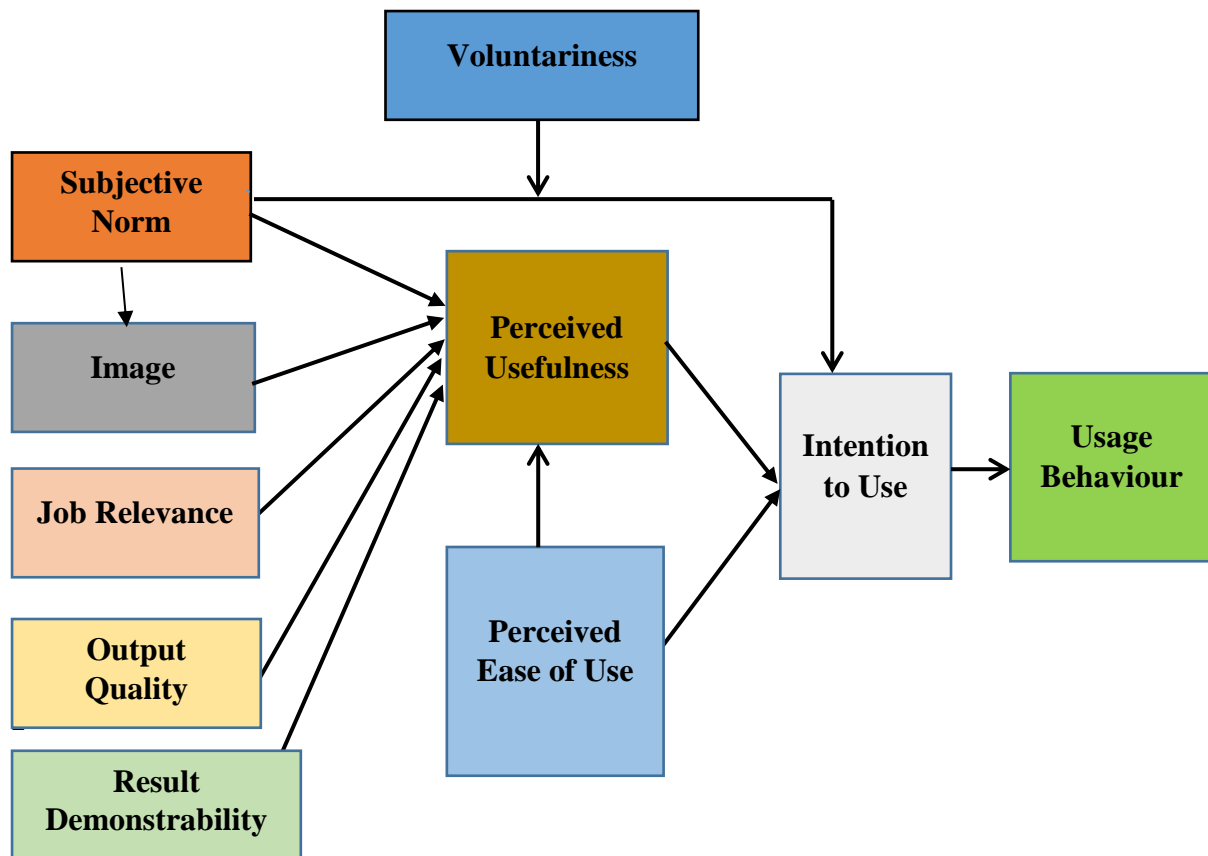
Figure 1. Technology Acceptance Model 2 (TAM 2)

Source: (Venkatesh & Davis, 2000, p. 188)

TAM2 incorporates the subjective norm, voluntariness, and image, which are three interrelated social contrasts. These contrasts help to determine if an individual will adopt or reject a new system. These instrumental determinants are defined in Figure 1 above. The first two determinants fall into the category of social influence and the remaining determinants are system characteristics as per the theoretical framework. TAM2 posits that perceived ease of use and result demonstrability have a positive direct influence on perceived usefulness. Job relevance and output quality will have a moderating effect on perceived usefulness such that the higher the output quality, the stronger the effect job relevance will have on perceived usefulness. The researcher adopted this theory because of its relationship to the problem under investigation.

1.8.1 Perceived Usefulness (PU)

Defined as "the extent to which a person believes that using a particular system will enhance his or her job performance" (Sun et al., 2009, p.52). Consequently, it is related to the belief that technology enhances an individual's performance (Liu et al., 2010). The TAM and its

extended models from other researchers uncover that PU enhances a person's objective in mandatory and voluntary situations (Verkasalo and Davis, 2000).

1.8.2 Perceived Ease of Use (PEU)

(In line with this theory) The extent to which a person believes that using a particular system will be free of effort (Sun et al., 2009). Studies validated that when individuals think employing a certain technology is easy to use, they will be inclined to work with it (Davis, 1986; Liu et al., 2010). Connecting this fact to the Mwabu interactive tablet, it is assumed that if Mwabu tablets are easy to handle and usr, teachers will make use of it. As in the case of PU, PEU influences a person's attitude towards using their technology system (Venkatesh and Davis, 2000).

1.8.3 Subjective Norm

Defined as a person's perception that most people who are important to him think he should or should not perform the behaviour in question (Venkatesh and Davis, 2000). In the context of this research subjective norms can be thought of when teachers and pupils perceive that utilising an interactive tablet is a normal thing to do.

1.8.4 Voluntariness

This is a measure of how much choice a person has about using a computer system normalises through compliance, the intention to use, over and above-perceived usefulness, and ease of use (Venkatesh and Davis, 2000). Where there is a choice, the effect will not be significant. In the context of the research question, this might be whether the teacher feels obligated to use the interactive tablet when teaching or not and if over time they find that they choose to use it more and more when assisting.

1.8.5 Image

How an individual perceives that they are viewed by individuals important to them or to put in another way, their social standing. If individuals perceive that doing certain behaviour is the subjective norm then this may have a positive impact on their image which positively feeds into the perceived usefulness of the IT system (Venkatesh and Davis, 2000). Some teachers may feel that their self-image may be affected if others perceive them to be backward or resistant to change and may be more likely to use the interactive tablet.

1.8.6 Intention to Use

Over time as individuals become more expert in using the system the positive effect of subjective norm on intention to use will wane (Venkatesh and Davis, 2000). Also, the positive effect of subjective norms on perceived usefulness will wane over time, regardless of whether usage is voluntary or not. Over time teachers should become more expert at using interactive tablets when giving homework assistance which should drive more intention to use.

1.8.7 Job relevance

The perceived relevance of the IT system is to an individual's job. In the case of measuring the impact of interactive tablet devices, this will be how relevant the teacher feels that using the tablet is to assisting their pupils with learning materials. Job relevance will have a positive effect on perceived usefulness.

1.8.8 Output Quality

The perception of how well the system performs the tasks it is being used to do. Output quality impact on perceived usefulness should be positive (Venkatesh and Davis, 2000). If teachers perceive that the interactive tablet can give better assistance, quality and that their pupils' resultant schoolwork is of better quality this should have a positive effect on intention to use.

1.8.9 Result demonstrability

Briefly put this as tangibility of the results of using the innovation (Venkatesh and Davis, 2000). As in output quality above, if teachers feel that the results are better as a result of assisting using interactive tablets, such as in-state exam scores, users are more likely to accept them as a useful device.

1.9 Justification for using TAM2

The researcher proposed to use TAM2 to understand the usefulness of interactive tablets in facilitating teaching and learning activities in private primary schools. This is because TAM2 gives an understanding of the degree to which a person believes that using a particular system would enhance his or her performance and perceived ease of use of ICTs, and the degree to

which a person believes that using a particular system would be free of effort. Furthermore, David et al. (2002) explained that perceived ease of use has a direct effect on perceived usefulness and both determine the consumer's attitude towards use, which leads to intention to use the system. TAM2 model offers more in-depth information by explaining the key factor of perceived usefulness which is the pre-step of usage behaviour (Venkatesh and Davis, 2000).

1.10 Hypothesis

In this study, the researcher examined the relationship between the dependent variable and the independent variable.

1. H_0 = There was no positive relationship between perceived usefulness and teachers' use of the Mwabu interactive tablet

2. H_1 = There was a positive relationship between perceived usefulness and teachers' use of the Mwabu interactive tablet

The hypothesis was aimed at establishing the relationship between perceived usefulness and teachers' use of the Mwabu interactive tablet

1.11 Operational Definitions of Concepts

As affirmed by Mulima (2014), understanding how various concepts that have a bearing on the research topic are being applied in the study is critical to avoid misunderstandings. Therefore, the following key terms should be understood in the context of this study:

Education: The process of training and developing the knowledge, skills, mind, character especially by formal schooling (UNESCO, 2011).

E-Learning: It is the use of digital tools for teaching and learning. It makes use of technological tools to enable learners to study anytime and anywhere. It involves the training, delivery of knowledge and motivates pupils to interact with each other, as well as exchange and respect ((Romiszowski, 2004).

ICT: Are the diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information for their academic purpose (Asabere and Enguah, 2012)

Learning: Means a process of acquiring new, or modifying existing knowledge, behaviour, skills, values, or preferences by undergraduates (Robbins, 2002).

Mwabu tablet: The Mwabu tablet is a comprehensive eLearning tablet pre-loaded with iSchool learning material that has animated lessons with illustrated stories and they are all voiced and written in English and 8 major local languages; Bemba, Kaonde, Lunda, Lozi, Luvale, Nyanja (Standard), Tonga and Lusaka Nyanja (Mweetwa, 2016).

Primary school: It is the foundation of everyone who gets into school, going from grade 1-7 with pupils who are expected to pass the examination set by the Examination Council of Zambia at the end of the grade seven i.e. after seven years of school (Sen, 2010).

Utilisation: Ii is the process of integrating or deploying ICT resources for learning by undergraduates (Sheehan and Stabell, 2010).

Mobile Technology: Portable devices, software, tools and many other things that help people to conduct, create and understand actions, procedures for what they try to do (Allyand Needham, 2010).

1.12 Summary of Chapter One

Chapter one focused on the background information of the study on the usefulness of Mwabu interactive tablet which is one of the tools that has enabled the integration of information and communication technology in education. The chapter has shown that most of the Zambian private primary schools use the Mwabu interactive tablet, which is a complete e-learning system and is centred on providing lesson plans for teachers and online interactive multimedia learning content for pupils. The next chapter provides a review of the literature relevant to the study of interactive tablets in education.

<center>**CHAPTER TWO: LITERATURE REVIEW**</center>

2.1 Overview

The chapter reviews the literature related to the usefulness of interactive tablets in facilitating teaching and learning in the classroom and other related literature on the topic of study. Kumar, (2005) explained the importance of doing a literature review that brings clarity and focuses on the research problem, as it helps the researcher to understand the subject area better, thus helps to conceptualise the research problem clearly and precisely. It also helps to understand the relationship between the research problem and the body of knowledge in the area. Literature review improves the methodology, as it tells the researcher if others have used procedures and methods similar to the ones being proposed, meaning which procedures and methods have worked well for them, and what problems they have faced.

The literature review also improves the methodology, as it tells the researcher if others have used procedures and methods similar to the ones being proposed, meaning which procedures and methods have worked well for them, and what problems they have faced. The sources of information in the literature review include journal articles both open and closed access, reports from education organisations, books, and recommended readings from the supervisor among others. Therefore, this literature review was guided by the research objectives and themes were developed from the following.

  i.   To explore how the Mwabu interactive tablets are utilised by teachers and pupils,
  ii. To determine the teaching and learning materials integrated with the Mwabu interactive tablet,
  iii. To examine the perceived usefulness of teaching and learning materials integrated with the Mwabu tablet

2.2 Utilisation of Interactive Tablets in Education

The introduction of ICTs, especially the use of interactive tablets has brought immense changes in the world and more so in communication. Educational institutions are under increasing pressure to use the new information and communication technologies (ICTs) so as to teach pupils the knowledge and skills they need in the 21st century (Yang & Wang, 2012). ICTs have the potential to transform the nature of education: where and how learning takes place and the roles of pupils and teachers in the learning process.

The initial conception of expanding education to include technology has been evolving in the last century as emergent technologies become available (Greenwald & Fiedler, 2009). Changes in educational practices have corresponded with iterations of new technologies since that time, with varying levels of success in classroom applications (Reiser, 2001). Since the inception of the Internet and the home computer, the rate of technology integration in education increased exponentially in the last decade (Hagood, 2011). The implementation of technology in the classroom is essential in the 21st century as children are prepared for their future in a rapidly changing world.

The rapid pace of technology development is a continuous challenge for educators and researchers looking for technologies that are helpful for teaching and learning in the classroom (U.S. Department of Education Office of Educational Technology, 2010). Digital Promise, a White House initiative, brings together the government, schools, and business to meet this rapid growth. The program finds emergent technologies that show promise or have evidence of success (Office of the Press Secretary, 2011). However, knowing what emergent technologies are on the market is not sufficient for educators who are contemplating adopting certain technologies in the classroom. Indeed, the excitement of an emergent technology can act as the impetus for adoption of that technology without knowledge of effective use in education, a pattern that has been observed since a few decades ago (Clark, 1983).

A critical component for successful technology adoption is how teaching and learning strategies are implemented when using the technology (U.S. Department of Education Office of Educational Technology, 2010). The Apple Classroom of Tomorrow (Dwyer, Ringstaff, & Sandholtz, 1991) paved the way for large-scale one-to-one (1:1) laptop projects that were embraced by many schools and led to changes in teaching practices (Dawson, Cavanaugh, & Ritzhaupt, 2008; Dwyer et al., 1991). However, the effects of laptop uses in the classroom have been inconclusive. For example, whether laptops had effects on test score improvement has been inconsistent (Richtel, 2011; Sauers & McLeod, 2012; Stansbury, 2010). A number of schools tried the 1:1 laptop program for a few years and determined that there was little educational benefit and chose to discontinue (Stansbury, 2007).

Other issues such as cost and training have compelled states and districts to make budget choices for the purchase of other educational resources (Marra, 2011). Some schools continued with laptop programs and had difficulties finding evidence to support the expenditures on such expensive technologies in the classroom (Richtel, 2011; Weston &

Bain, 2010). Overall, empirical evidence supporting benefits of laptops in the classroom has been insufficient (Bebell & O'Dwyer, 2010; Dunleavy, Dextert, & Heinecket, 2007).

Important to note is that some studies did not isolate the impact of teachers' skills in the technology use or other concerns such as teaching strategies that impact student learning beyond the new technology implemented (Richtel, 2011). Bain and Weston (2009) indicated that as laptops were used in many classrooms, the methods of teaching remained the same, demonstrating minimal impacts of laptops on learning. Computers were used mostly for productivity in the classroom and were often a distraction from teaching and learning (Dunleavy et al., 2007). However, there have been various instances of successful 1:1 laptop programs that produced improved test scores and student motivation (Holcomb, 2009; Sauers & McLeod, 2012), offering hopes for one-to-one programs employing laptops or other technologies.

The use of technology in education also has impacted the way that educators present information, the way pupils learn that information, and the overall availability of academic materials. The implementation of technology is seen at various educational levels as it has provided new and interactive platforms of learning that can be adapted to suit the educational needs of pupils at any age and promotes collaborative learning (Resta & Laferrie, 2007). Regarding the college setting, it is clear that technology has become heavily integrated; both professors and pupils utilise a myriad of different technological platforms to enhance the learning process. Studies in the United States of America indicate that more than 90% of college pupils own a laptop and use it both in and out of the classroom, a significantly higher proportion than what had been reported just years prior (Resta & Laferrie, 2007).

Computer and laptop usage has increased at all levels of academia; one new form of technology that has rapidly made its way into the classroom is the tablet computer. Tablets are viewed as a revolutionary platform for learning and communicating in that they provide a portable and interactive method of strong content and engaging with peers (Enrique, 2010; Simon et al, 2004). They also provide educators with a new method of teaching that integrates traditional presentation elements with a more dynamic and engaging presentation method (ibid). The first tablets were produced only five to six years ago, and the use of tablets in teaching is therefore a new experience. There has been limited research on the consequences of their use in the context of learning.

In recent years, pupils and educators alike have utilised tablet computers as a means of enhancing the learning process (Twining, 2005). Since this is expected to improve the quality of teaching and learning, teachers are tasked to be the curriculum implementers in their respective classes and be in a position to pass the knowledge they have on ICT to the learners. According to Park and Chan (2012), the utilisation of tablets is achieved when the perceived usefulness of tablet use is combined with other factors like behavioural intention, attitude, and perceived ease of use as well as self-efficacy of e-learning. Though it is argued that the use of tablets by young children is not proper, several results show that the impact is positive since the children portray intelligence, structural knowledge, problem-solving skills, and proper language skills (Vernadakis, 2005).

Recently less expensive tablets have been adopted for schoolwide use (Cohen, 2012; Faloon, 2013; Foote, 2012), often without clearly articulated learning goals or extensive involvement by teachers in the planning process (Peluso, 2012; Powell, 2014). Although there are articles and reports on iPads in schools that outline the apps examined for their educational value (Faloon, 2013; Raths, 2013; Schaffhauser, 2013; Sykes, 2014) or the path to implementation (Cohen, 2012; Foote, 2012), these works often have excluded users' perspectives on the educational value and effectiveness of the technology. Understanding how pupils and teachers perceive using tablets in the classroom during the initial year of implementation is essential for adopting or developing tablet applications for classroom use.

A tablet is a mobile computing device that has a flat, rectangular form like that of a magazine or pad of paper that is usually controlled by using a touch screen (Twining, 2005). Besides, it is typically used for accessing the Internet, watching videos, playing games, reading and electronic books. Moreover, in terms of education, interactive tablets are a recent addition to the long list of technological innovations that support and enhance the learning and teaching process, in addition to smart mobile devices. In addition, teachers can rely on this technology as a teaching aid.

Research by Twining (2005), showed that pupils utilise the Tablet PC in a variety of ways. The mobility of the Tablet PC allowed pupils to take it anywhere, into the classroom for a lesson, or out onto the oval during recess or lunch. Pupils used software specifically designed for the Tablet PC, Microsoft OneNote, DyKnow, or Windows Journal to organise their subjects, write notes, or do worksheets specifically designed for the Tablet PC by their teacher. With Microsoft OneNote's capabilities, pupils were able to record lectures or

lessons while they wrote their notes. Some even used the Tablet PC to record video through a webcam and have that also embedded in the OneNote file. These files could then be saved and reviewed at a later date (Cicchino & Mirliss, 2004).

Microsoft OneNote was also used by Microsoft Corporation (2011) as a way to standardise delivery; teachers' OneNote workbooks included text, video, audio, and graphical material, then pupils wrote comments into those files using the Tablet PC's pen technology. Pupils were able to annotate work and send it to either their teacher to review or to colleagues for collaboration. The tablet PC gave the pupils the ability to be able to draw diagrams and pictures and easily insert these straight into their work.

Burden et al, (2012) carried out a study about adopting portable technology in eight individual learning sites in Scotland. The study results showed that the use of tablets facilitated the learning process. The adoption of interactive tablets in the classroom made it possible to access the internet, which made a wide range of interactive learning activities available in a way that has never been there. The use of tablets has also encouraged teachers to discover certain alternative activities for learning.

Naace, (2012) carried out a study about the use of interactive tablets at Long Field Academy in the United State of America (USA) which is a mixed school with 11-18 years old pupils. Most of the pupils at this school owned tablets and teachers used tablets regularly in teaching. The study results indicated that the use of the tablets had a significant positive effect on pupils' learning English, Maths, and Science. Teachers stated that using the tablets mitigated the workload because it was easy to use and cost-effective. Further, it was discovered that interactive tablets were used in doing homework in addition to the accompanying activities. Pupils' motivation towards learning also increased upon using the tablets and their work quality, educational progress, and cooperative work level improved. Pupils and staff stated that they worked with more efficiency when they used the tablets.

Valstad (2012), conducted a study that aimed at evaluating the interactive tablet appropriateness to classrooms, the advantages and negatives of using them, and whether they increased pupils' learning motivation. The collected data received more analysis and discussion because they showed that using tablets in the classroom had some advantages with some negatives. Tablets are appropriate, convenient regarding size and readability. Tablets

provide multimedia that represent the content and give pupils alternatives and choices of expression that increase their motivation.

A study was conducted by Zimmermann (2013), evaluated the use of interactive tablets in (3) primary schools in Britain. Interactive tablets were distributed to pupils and a fourth school was selected as a control group that does not use tablets in education. Interviews were done with school principals in addition to using class observation to collect data. Eighteen (18) Focus groups were formed from pupils, parents, and teachers. Results showed many advantages, which include increasing motivation, parents' participation, and teachers 'ability to follow up pupils' progress with more proficiency; increase cooperation between teachers and pupils. It was discovered that the use of interactive tablets give pupils a feeling of integration in learning regardless of socioeconomic status or achievement level. Tablets provide a new educational model of student-centred learning.

Keil and Clay (2013) in their study aimed at investigating the advantages of using interactive tablets in the classroom for the primary stages for Science, Technology, Geometry, and Mathematics' in the United States of America. Results showed that using activities based on the tablets contributed to fostering pupils' participation and their enjoyment of learning in addition to increasing building concepts among them.

Galletta (2013), carried out an exploratory study on the possibility of using interactive tablets in high institutions of learning in the United State of America. Three cases that covered model school tasks were studied. The study depended on interviews of focus groups and a longitudinal test study of a group of users for more than five months at North America University. Data analysis showed that tablets, in addition to laptops, were useful in pupils' comprehension of the learning materials, in co-operative activities, and social interaction. Nevertheless, they require more improvement and produce more e-books and electronic content. The practical application of tablets in education represents one kind of benefit of employing such a device in the learning society. Researchers indicate that tablets can influence the learners schooling behaviours.

Leach and Moon (2000) in their study agreed tablets have the potential of changing how learners' development processes take place and enabling quick access to academic resources. They suggest that tablets offer an understanding of new professional knowledge, new practices in teaching, facilitation of social participation structures, and enabling learners to

reflect on the whole learning process. On the other hand, the researcher argues that these tools can only be effective to learners if they have a change of mind and begin to embrace the introduction and use of technology in general and the tools in particular. It is also argued that tablets can make pedagogy more efficient since they can extend and transform the process from both the teaching and learning perspectives. Some positive effects of tablet integration include positive pupils' response in class, tablet compatibility in teaching methods, ease in teaching, and access to information and updated resources, and being able to achieve more in a short time (Rajasingham, 2011).

A survey of over 6,000 primary school pupils in Quebec, Canada highlighted both benefits and limitations of the use of Tablets in the province (Karsenti & Fievez 2013). According to Karsenti and Fievez (2013) the iPad programme had not yet reached its full potential, because it was not yet sufficiently integrated into teaching and learning, several benefits to pupils were visible. They included constant access to information, and communication, increased collaboration among both pupils and teachers, increased motivation, improved quality of pupils' and teachers' presentations, more creativity, a greater variety of resources and types of learning material, development of both teachers' and pupils' IT skills, and a more personalised learning experience where pupils were able to work at their own pace. Practical benefits included a reduction in the use of paper and the ease of organising notes and other learning materials.

Access to tablets allowed pupils to reduce the number of books that they needed to carry around with them. Microsoft One-note was also used by Microsoft Corporation (2011) as a way to standardise delivery; teachers' One-note workbooks included text, video, audio, and graphical material, then pupils wrote comments into those files using the tablet PC's pen technology. Pupils were able to annotate work and send it to either their teacher to review or to colleagues for collaboration. The tablet PC gave the pupils the ability to be able to draw diagrams and pictures and easily insert these straight into their work (Karsenti & Fievez 2013).

In a similar study done by Twining (2005), software such as the Microsoft Office suite with inking capabilities was used and many pupils used Microsoft Word to write notes or annotate typed work. Microsoft PowerPoint was another piece of presentation programme that was commonly used to create assessment tasks (ibid). The technology allowed pupils to pick and choose how and for what they use the tablet PC. It was a lot easier than that of the traditional

pen and paper. Twining et al. (2005) in their study, suggested that pupils can be accommodated for their different learning styles quickly and easily when using a tablet. The tablet PC acted like a pen and paper; pupils could quickly sketch out their ideas, such as sketching complex shapes or writing mathematics equations easily.

Many of the case studies indicate that using a tablet was a fantastic way for pupils to store their books and notes; everything in one place, no issues with pupils forgetting to bring a pen or something to write on. Ifenthaler and Schweinbenz, (2013) highlight that the tablet PC was like a portable classroom where pupils always had their books, assignments, notes, and study resources. There was no reason for pupils to not have the required tools for learning.

A report from the British Educational Communications and Technology Agency, (2004) stated that pupils commented on how the learning was fun and more enjoyable when using Tablets. They had improved their attention spans in the classroom; interaction with others had also increased. Many pupils' motor control skills improved via the use of the pen and the tablet PC. The study also stated that pupils found the tablet PCs were easy to use and were motivated to work using them. Teachers cited this motivation as a significant factor in the student's academic progress, most frequently concerning handwriting skills. It was also stated that tablet PCs were associated with improved behaviour and self-esteem of pupils and promoted collaborative learning.

Pupils claimed it was the ability to fold flat and the mobility of the tablet PC that encouraged its use and increased the amount of time they spent working. Reboli and Enriquez (2010) agreed that the use of the tablet increased motivation, and hence it was likely to have a positive impact on learning outcomes. Its use also supported moves to more independent and collaborative study as well as giving pupils' confidence in learning, improving their interaction with other pupils and increasing their knowledge retention. Pupils reported that having tablet PCs and supporting software made school more enjoyable.

Park and Chan (2012), claimed that mobile teaching encompassing tablets produced new possibilities for communication and commanding teaching. Tablets assist the pupils to think decisively, solve situations, and make accurate choices. One of the skills in learning is note-making and taking. To improve this skill as a segment of active teaching, some computer science teachers established a PC tablet initiated strategy to motivate learners to send inquiries and records in working together to solve the allocated situations in the course of the

lecture. The educator could see all the learners' solutions and select one or two to demonstrate on the screen, and he could interpret them digitally while describing them.

The application of the tablet is not restricted only to disburse them amid pupils to be appropriate independently; it can be pertinent as an electronic writing board as well. The use of tablets alters the style of presentation rather than using static slides, educators presently can employ multimedia presentations, interpret slides while discussing, and document presentations. Tablets permit drawing, interpreting, and documenting using a variety of colours of ink by the infinite number of pages devoid of the necessity to expunge them (Chen, 2009). Learners can also review the notes out of the class setting employing a variety of software and not essentially through tablets. The application of tablets in teaching extended from the school to help pupils consolidate their education. Whether engaging commercial almanacs or utilizing systems such as the Doodle, learners can keep the trace and the timetable of their group schemes and engagements for example.

Tablet as a mobile device, has made computing more accessible for different people. The simplicity of touch interactions and the portability of these devices have decreased the barriers for interacting with computers (Liang, 2013). They can also enable additional social behaviours such as passing the device to a partner. As a multifunctional device, the tablet can be used to surf the web, read books, play games, and interact with online friends all activities, which can aid the development of individuals with special education needs (Holstein, 2012).

Hourcade (2013) studied the use of tablets by children with Autism spectrum disorder (ASDs) in the United States of America. They used applications from Open Autism Software that use collaborative and expressive activities to encourage positive social relations. They compared results from activities without the applications to results from activities with the applications. They recorded video of the activities and noted the children's behaviour. The results from the study were that in the activities with applications children interacted more verbally and they were more involved in the activities. The study also showed that children behaved more encouragingly in the activities conducted with two specific applications. The results prove that the tablets with correct applications can help improve positive social interactions in children with ASDs.

Harrel (2010) reported that a mother's feelings about tablets' impact on her son were positive. Her son is a young child with ASD who shows typical symptoms of verbal skills and

aggressive behaviour. After a working period with tablets, the mother realised that her son started to behave more independently. He started to do things that he was not capable of before and his aggressive behaviours reduced (Harrel, 2010).

The Danish study by Jahnke and Kumar (2014) studied how teachers integrated iPads in 15 different classrooms. One of their main findings was that the strength of tablets lies in the potential of collaboration and feedback in the learning processes, as well as teachers adopting tablets as a vital part of their didactical design

Hourcade et al. (2013) expressed that there is not enough empirical data showing benefits of specific design or use of tablet approaches for children with impairments. Tablets allow children with impairments to interact more easily, moreover tablets can support them for improving their skills in areas they need (Hourcade et al., 2013).

2.3 Materials Integrated with Interactive Tablets

One important feature of tablets is the variety of software available in the form of applications, which are downloadable from the Internet and designed for use on mobile devices (Neumann, 2014). There are thousands of apps available for download, either free or paid for. Among these are many educational apps to suit different customers (Henderson & Yeow, 2012). There is also a range of apps specifically designed in child-friendly mode to help children learn, such as those in the form of matching or sorting games to teach children about letters, sounds, colours, and shapes (McManis 7 Gunnewig, 2012).

Both pupils and teachers made use of software such as Microsoft OneNote or Microsoft Journal that had the unique ability to use a pen to write ('ink') using the unique software. Microsoft Corporation (2011b) showed that this software also allowed the teachers and pupils to compile workbooks that included text, audio, video, and graphics that reduced the need to carry traditional books with them.

Ostler and Topp (2013) reviewed the impact of the use of a specific app with university Maths pupils. In their study two classes made use of the application ShowMe Interactive Whiteboard for digital note-taking during lessons. The notes could include audio, video and animations in addition to normal text and were used for practice and revision. The authors found that pupils found the app easy to use and helpful for revision. Pupils using the app described revising as 'being taught by a teaching version of them.

Mock (2004) in the United States of America suggested that the Tablet PC had unlocked the user's capability to use several different software types, which in turn had given the user the ability to 27 learn new skills or improve those ICT skills already learned. He proposed that the introduction of Tablet PC software like Microsoft OneNote, PowerPoint, or Journal introduced the user to new skills that could only be learned using a Tablet PC. Ferrer, Belvic, and Pamies (2011) suggested that the pen technology-assisted many pupils in improving their handwriting skills via the pen technology, which then supported the pupils in improving their ICT skills in other areas. It was also suggested by schools that the Tablet PC had the potential to enhance learning far more than any traditional style of learning, as seen in Twinning et al. (2005). These schools could see the potential for the Tablet PC in improving everyone's ICT skills.

Twining et al. (2005) suggested that there was a wide range of new strategies being used in the classroom by both pupils and teachers, many having a significant impact on the learning of the pupils. The Tablet PC supported and extended the curriculum and broadened the practice of the teachers. They saw how the technology had already transformed aspects of their teaching and could do so in the future, "the result of using Tablet PCs alongside these approaches was that staff had begun to expand their use of ICT into preparation and teaching in both classrooms and sports areas" (Mirlisss, 2004). Pupils relied more on what was stored on their Tablet PC and less on the books and stationery that they had previously been required to supply in each class. Information could be gathered far quicker and then processed into output a lot easier than traditionally.

A study done by Twining (2005) found that teachers had changed the way they were teaching, from the more traditional style of being teacher-focused, to a very interactive student-centered approach. The Tablet PC had allowed pupils to become much more involved in the overall structure of each lesson. Information was being obtained at a far greater pace; teachers were becoming better prepared for lessons and could show a more diverse range of resources far more easily. There was far more interaction between the teacher and the pupils as well as between the pupils themselves.

Coe and Preist (2004) suggested in their research that teachers now saw ICT as just another teaching tool, not a completely separate subject. Teachers changed the way they planned and taught classes, using the Tablet PC, and programmes like Microsoft OneNote, to do away with textbooks and workbooks, to replace them with an electronic version that used the

"inking" capabilities of the Tablet PC, as seen in research by Mock (2004). Cicchino (2004) in their research, allowed the teacher to be able to mark the pupils' work with ease, reducing the time taken to mark and return the work, increasing the speed at which feedback was given.

In a study assessing the experiences in a New Zealand primary school where iPads were deployed to pupils aged 5–12 (Henderson and Yeow 2012), the devices were shared and not used as personal devices. Henderson and Yeow still observed positive impacts on learning and argue that this was partially due to the size of the screen. Being roughly the same size as a book, the device was thought to encourage pupils to engage with it the same way they would with a physical storybook. The authors further argue that the mobile devices encouraged collaboration as their size stimulated face-to-face interaction. Interactivity and instant feedback was also mentioned as a benefit that facilitated independent learning. Being able to carry the device across different locations was shown to allow pupils to access information and communication on the go. Henderson and Yeow further argue that the motivation that came from being able to access enjoyable learning content independently encouraged pupils to take control of their learning.

2.4 Perceived Usefulness of Interactive Tablets

Dhir, Gahwaji et al. (2013) carried out a literature review on the primary subject of the role of the tablet in education and found several frequently perceived benefits, which included ease of use, suitability for 'anytime and anywhere learning', use for both classroom demonstrations and small group teaching activities, a wide range of educational apps, the ability to support interactive and collaborative learning, and increased communication between pupils and teachers. Another benefit was the use of tablets for e-reading, which included the ability to support pupils with literacy difficulties, including pupils for whom English was a second language. Besides, it was found that the Tablets could potentially reduce teachers' workload by enabling the digital collection and marking of assignments and providing easy content production and delivery to pupils. Tablets have also been linked with greater autonomy and motivation to teach (Churchill, 2012).

Churchill, Fox et al. (2012) argue that the extent to which tablets will be used in education depends largely on teachers' perceptions of the affordances of this technology. They further argue that one of the limitations of research on the impact of Tablets is that it often looks at the affordances or qualities of Tablets separately from teachers' theories of how they can be

used in teaching. While previous research has assessed pupils' perceptions of using Tablets for learning, and found that pupils often report feeling more motivated and encouraged to learn, Churchill, Fox et al. argue that this is not sufficient evidence of Tablets' impact on learning. It is therefore argued that studying the qualities of the technology and how these qualities are mediated by teachers' own attitudes towards technology and how it can be used is a better way of predicting the impacts Tablets can have on learning.

Another range of studies assessed perceptions towards the use of tablets in educational contexts. The studies focused on the teachers' perspective (Ifenthaler & Schweinbenz, 2013) whereas others focused on pupils' perspectives. In higher education, pupils' attitudes towards the use of mobile learning (smartphones and tablets) were usually positive (Shaalan, 2016). In their literature review, Nguyen, Barton, & Nguyen (2015) pointed out various studies corroborating pupils' positive attitudes towards using an iPad for learning. Nevertheless, some limitations to these positive attitudes were observed due to distraction caused by non-educational usage.

Acceptance models offer a strong theoretical framework on how users perceive the use of tablets for learning. The perceptions determine the intention and behavioural use of tablets, but may also predict other critical factors for learning. They can influence pupils' involvement in learning tasks, the value they ascribe to learning tasks with tablets, and more widely their motivations. For instance, compared to a traditional lesson, the use of iPhone devices might lead to higher motivational outcomes for children (Churchill, D., and Wang, T. 2014). However, more investigations are needed to understand the nature of motivations and their real predictors. Examination of perceptions should contribute to a better understanding of motivations linked to learning tasks with technologies, especially in a perspective of expectancy-value models of motivation (Barron & Hulleman, 2015).

Indeed, these approaches of motivation consider two main components: the expectancy of being successful in a task and the perceived value. Moreover, some studies have also shown that perceptions can be related to learning engagement or perceived self-regulated learning. For example, Liaw and Huang (2013) showed that perceived satisfaction and perceived usefulness of an e-learning system predicted perceived self-regulation of using e-learning. Soffer & Yaron (2017) found that the more pupils experienced the ease of use with a tablet, the more they perceived themselves as engaged in learning. Thus, it is important to achieve a deeper picture of how users perceive the use of tablets for learning. Finally, examining the

learning technology perceptions that pupils have can contribute to a more objective view of the heavily controversial notion of "digital natives" (Bennett, Maton, & Kervin, 2008).

Nielsen (2011), through a case study in the United States of America described how music teachers define student development and creativity through music technology. Nielsen suggested that lesson strategies need to incorporate technology. This would enable teachers to provide opportunities to expand the music curriculum that fosters the creativity of all pupils. Using technology in teaching would not only enhance music education but would support 21st-century skill development for pupils (Nielsen, 2011). Evans and Forbes (2012) investigated what educational moves would be needed to meet the needs of technology-based learners in the 21st century. It was suggested that teachers should rethink the way they design teaching strategies, as the desktop stage moves directly to wireless mobile devices.

Rossing (2012) supported the need for a meaningful understanding of the use of mobile technologies in teaching. Teachers need to direct the use of mobile technologies to their desired outcome of their teachings. Problem-solving and innovative applications need to be fostered by the teacher in the teachings of their discipline to what they want as the outcome of learning for their pupils. Almekhlafi and Almeqdadi (2010) recommended the following to enhance teachers' competency in integrating technology: workshops for effective technology integration; provide teachers with up-to-date technology; provide incentives for outstanding integration in their classrooms; provide release time for planning effectively; explore technology use in all schools, private or public; investigate student achievement and attitudes, and investigate integration concerning curriculum goals and outcomes.

Shohel and Power (2010) found that the use of iPods in classrooms was beginning to emerge with endless possibilities. It was suggested that more research needs to be done on the actual consequences of using portable technology. It is to be seen how portable technologies like iPods can be used to support teachers' professional development in teaching, using portable technology. Avraamidou (2008) contended that future research should focus on the use of mobile technologies to address deficiencies in curriculum and instruction to develop a contemporary vision of technology in both teachings and society. Given the advancements in technology over the past ten years, Avraamidou (2008) suggested that rapid advancements in mobile technology have transformed society.

Twum (2014), suggested mobile devices are useful in many pedagogical and technological applications for teaching. Mobility of the device allows for continuous work on both projects and assignments. It was found that pupils were selective in software downloads specific to their discipline or personal needs. Pupils would arrive in class prepared with questions and ideas that they shared with other pupils outside of the classroom setting. It was in the hope that new technologies would be available to help pupils learn in classrooms without boundaries.

Marzano and Pickering (2003) stated that many researchers agree that the impact of decisions made by individual teachers is greater than the impact of decisions made at the school level. Many factors contribute to the effectiveness of learning including the various instructional strategies that a teacher employs. Knowing how and when to use technology for student academic success in their lesson design can help children learn things better, it also can help them learn better things (Roschelle et al., 2000).

The idea, of integrating ICT subjects such as science, mathematics, and technology, was presented by Bussière and Gluszynski (2004). It was found that the integration of technology showed a higher level of motivation for pupils designing applications for problem-solving. It was believed that when technology was integrated into subject areas, the curriculum was enhanced significantly. Technology can be for this reason used as a tool to teach many concepts and principles of other content or subject areas. Many other curriculum standards are tied to technology and technology education (Foster, 2005). Lovedahl (2001) previously proposed the integration of technology education in the curriculum such as science so that experiences needed to promote active learning, group problem solving, and interdisciplinary use of a variety of technologies related tools and products in teaching strategies would be employed.

Wicklein (2005) proposed that teachers could instil values in our youth through technology education. Appropriate technology concepts taught in schools would substantiate and support the ability to understand and operate technological systems for the benefit of pupils rather than the detriment of pupils. Haugland, (2000) also believed that pupils will solve problems with more responsibility as technology becomes a more integral part of their lives. For this reason, the importance of teaching responsible use of various technology tools through programs relevant to and including teacher's perceptions and experiences when using

technology in their teachings is important. The philosophy of teachers' teachings is reflected in the types of technology experiences their pupils receive (Marzano et al., 2003).

Teachers who avoid computers are usually the ones who appear to be most traditional in their philosophy of teaching. Traditionally in their philosophy of teaching, teachers gave information to pupils rather than acting as facilitators and guiding pupils to exploring and finding information. Healey (2001) formed the basis of the constructivist theory where prior knowledge forms the foundation by which new learning occurs (Gordon, 2009). Learning is mastered through new approaches and interacting with others (Zucker, 2005).

The teacher encourages pupils to discover concepts on their own rather than given the information at hand. Individual pupils perceive and process information in a variety of ways as a result of their upbringing, heredity factors, and environmental demands. According to Marshall (2004), how much a person learns depends on whether or not the educational practice is structured to their particular learning style. Those teachers who value a group work approach as well as working on topics of interest are more compatible with the constructivists' beliefs and are the ones who are using computers more frequently in their teachings (Becker & Ravitz, 2001).

The level of comfort, confidence, and competency relates to the teachers' ability and willingness to use technology. Peck (2008) pointed out that testimonials and teacher vignettes also indicate that the more confident teachers feel about using technology, the more likely they will apply what they have learned in the classroom, as well as pursue additional learning opportunities. The connection between teacher perception and technology use is also supported by Albion (1999) who noted that teachers' beliefs are viewed as a significant factor in their success in integrating technology in their teachings. Teachers are constantly aware of their impact on student achievement through their teachings.

These negative feelings towards technology use are shaped by a negative belief system. Eventually, these attitudes produce teachers who are technophobic and inhibit some from adopting new technology devices in their teachings (Peck, 2008). All educators hold a particular perception, attitude, and experience about the use of technology in the classroom. When a person enters the field of education as a teacher, most have already developed principles or beliefs (Bai & Ertmer, 2008). These principles can be based on cultural or

personal beliefs that can be in existence for a long period and can often be difficult to change (Oxford & Yilmazel-Sahin, 2004).

Individuals' perceptions form attitudes that can influence the way a person performs in their environment (Deemera, 2006). The way a person perceives success or failure often arises from their thoughts (Powell & Powell, 2007). Perceptions can bring several psychological concepts that can relate to both teaching and learning. According to Meskill and Mossop (2009), these perceptions can be related to methods of teaching. In theory, perceptions are multidimensional and can be either biologically or psychologically perceived. They are both used to understand individual differences and to predict human behaviour and its changes.

As Powell and Powell (2007) pointed out, perceptions of teachers can sometimes encompass the existence of entities that are outside control or influence. They can have both an evaluative and affective component and include conceptualisations that are aside from real situations. Perceptions can also come from memories of particular experiences, resulting in attitudes that are critically closed to evaluation and examination. The characteristics of teacher perceptions then demonstrate a cognitive psychological nature. When looking at the psychological perspective, Bem and McConnell (1970) suggested that in the theory of self-perception, human attitudes and perceptions are a consequence of a person's behavior. Our previous experiences become necessary when people evaluate perceptions and attitudes before making internal or external acknowledgments based on what caused them. When new technology is introduced, our inferred perceptions and attitudes influence our behaviour particularly when there is a lack of prior knowledge about or have a prior belief about a new situation (Bem & McConnell, 1970).

Bandura's (1986) social cognitive theory focused on the idea that actions are either facilitated or impeded in one's beliefs or perceptions and experiences. Cognitive dissonance suggests that teachers should engage in activities that arouse differences of opinion so that perceptions can be changed. With cognitive dissonance, a person's perception of the incompatibility between two cognitions can be a conflict between perceptions and emotions. The primary source of dissonance is an experience that collides with a new cognition (Harmon-Jones, 2009). What is psychologically outside the comfort zone will hold contradictory perceptions. The dissonance being very uncomfortable psychologically can motivate a person to change his perception or attitude or behaviour. Cognitions that are contradicting can initiate a person

to seek the invention of new perceptions or to modify existing perceptions to reduce the conflict between two thoughts (Harmon-Jones, et al., 2009).

Ashby, Baylor, Doerr, and Rosenberg-Kima, (2009) explained how the psychological perspective can be used to understand how our perceptions are formed. Social comparison is used to compare opinions, ideas, and abilities of each other to evaluate and re-evaluate to improve our perceptions. In essence, individuals assess and improve their perceptions when they can infer from other opinions and values that they can identify with. This explains why some teachers' attitudes are influenced by peers rather than their administrators or supervisors. The focus areas for technology programmes included raising student achievement, increasing engagement, creating student-centered learning environments, providing differentiated instruction, and positively impacting student attitude (Abell Foundation, 2008). For this to occur, it is the responsibility of a teacher to instruct pupils in a manner that enables them to achieve a higher level of understanding. In the past, instructional practices for most teachers were characterised as traditional where instruction was "teacher-centered" (Lambert et al., 2002).

Zmuda (2009) indicated that today's instruction shifted from the traditional setting where the teacher was the giver of information to that of a facilitator of information. With all the various learning styles of pupils, teachers must continue to find ways to teach concepts to a diverse audience so each individual can become successful (Zmuda, 2009). The instruction of today's pupils also includes exposure to electronic devices. Pupils today are in a world where electronic devices provide a quick fix at the push of a button. Pupils are fascinated by electronics such as smartphones, iPads, and chrome books which have become a way of life for them. With all the various technologies, teachers are expected to implement their use to support their instruction and improve student teaching (Wright & Wilson, 2007).

Johansson (2012) argues that the use of mobile technology in learning is gradually changing the role of the teacher. While this was previously more of a direct transfer between teacher and pupil, the teacher is now increasingly supporting pupils in acquiring independent critical research skills which are considered to be crucial skills for the 21st century. Johansson suggests that teachers are now taking on the role of 'filter' for search engine results and the availability of apps, guiding pupils towards reliable content rather than prescribing it. She further suggests that teachers are increasingly freed up from their dependence on published learning material and able to create their content.

Johansson (2012) monitored the way Swedish primary school teachers adapted to using Tablets in their teaching and their perception of Tablets compared to previous technology. She argues that one of the main reasons Tablets are as popular as they are in schools is because of the lack of impact computers have previously had in education. The teachers she interviewed associated school computers with long boot-up times, during which pupils would lose focus, as well as frequent software problems. She therefore argues that 'the escape from the computers that do not work in it becomes a driving force and motivation for learning a new system.

Bjerede and Bondi (2012) similarly argue that giving pupils personal mobile devices for learning necessitates changes to the curriculum, specifically the inclusion of digital citizenship. They further argue that educators must ask themselves questions on how pupils could be prevented from cyberbullying, looking at indecent content, becoming distracted in lessons, and damaging the devices. They stress, however, that bullying, indecent content, distractions, and damage to school property are not new challenges in schools but that these are now delivered in new ways through technology.

A study of the use of tablets in eight primaries in Scotland had reported an unspecified increase in the use of technology in the classroom (Burden et al., 2012). Tablets were also found to provide wider access to knowledge and resources, with many teachers noting that their internet use had increased after iPads were integrated into their teaching. Earlier researchers noted that the features and designs of tablets made them easily accessible and usable by even the youngest school pupils with minimal exposure (Melhuish and Falloon, 2010), which created an expectation that teachers could integrate tablets into their classrooms without training (Smith and Santori, 2015). The implication was that tablets required little or no investment in training for either teachers or pupils. However, later studies considered the need to train teachers (Karsenti and Fievez, 2013; Burden et al., 2012; Heinrich, 2012), as classroom use of tablets was found not to be as easy as had been presumed. Henderson and Yeow (2012) report that teachers found it easy to use tablets but difficult to create content appropriate to their lessons.

A study conducted by Khosla (2013) whose title was 'iSchool: Transformative learning in the Zambian classroom, on iSchool a stand-alone company in Zambia founded in 2010 whose core business is the production and sale of e-learning products that are produced and distributed by the company and targeted at school children across all income levels. The

study was gauging the use of the iSchool products (tablets and projectors) in School. The conclusion was that though daunting challenges remain, through its e-learning programme, iSchool has the ambition and potential to change the way education is delivered in Zambia.

2.5 Research Gap

The integration of ICTs in education is crucial for adapting traditional classrooms to the digital era. Over time, teachers and pupils are increasingly using touch screen technologies such as interactive tablets at school for teaching and learning purposes. The literature review shows that most of the researchers focused on the perception of teachers on the use of tablets in education (Bennett, Maton, & Kervin, 2008). Therefore, the literature shows that there is a significant gap in how useful the tablets are in facilitating teaching and learning activities..

2.6 Summary

The chapter presented a review of the literature relevant to the study with an understanding of the interactive tablets in schools. The literature review shows that little has been done on the usefulness of tablet education particularly in Zambia. The literature has shown that the use of iPods in classrooms was beginning to emerge with endless possibilities. It was suggested that more research needs to be done on the actual consequences of using portable technology. It is to be seen how portable technologies like iPods can be used to support teachers' professional development in teaching, using portable technology. The subsequent chapter presents the methodology used in the study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Overview

Chapter three outlines the research methods and procedures that were used in this study. It describes the philosophical approach that was used in answering research questions, research design, study area, target population, sample size, sampling techniques, reliability, validity, and the procedures and processes for pilot study. Further, the chapter explains the data collection instruments, data collection procedures, and methods of data analysis.

3.2 Research Design

A research design is an overall plan for collecting and analysing data including specification for enhancing the internal and external validity of the study. It involves a plan of activity which guides a researcher in collecting, analysing, and interpreting data). This research adopted a quantitative method. Kelly et al. (2003) notes that survey research methods can be used for both large and small populations. This is done by selecting and studying samples chosen from a population to discover the relative incidence, distributions and interrelations of sociological and psychological variables. Also Babbie and Mouton (2001) asserts that survey methods might be used for descriptive and exploratory purposes. One other notable advantage of the survey research design as stated by Babbie and Mouton (2001) is its flexibility. By using this method the researcher was able to ask questions in detail and also observed and collected information which helped her to answer the research questions.

3.3 Study Area

The study was carried out in eight selected private primary schools of Lusaka District. According to iSchool Zambia (2019), there were twenty-one (21) private primary schools in Lusaka District that were using Mwabu tablets for teaching and learning purposes. Out of the 21 schools that were using Mwabu interactive tablets in the Lusaka District, the research focused on schools that had two streams of grade seven, grade six, and grade five pupils and it was discovered that the schools were 8 which had one stream of those grades.

3.4 Target Population

The target population is defined as all the individuals' are interested in studying who have specific characteristics in common (Macnee, 2008). The target population involved teachers

who were familiar with the Mwabu tablet and grade seven pupils, grade six and five from schools that had two streams only. The group was picked because they had interacted with the tablet for some time, hence they were deemed to be the information-rich for the study.

3.5 Sample Size

The sample size is a smaller group or a subset of a group of interest that is studied in research (Macnee & McCabe, 2008). To select the number of pupils to participate in the study, the researcher established the total number of pupils in the selected private primary schools which was found to be 320 pupils. Therefore, the following formula by Cochran, (1963) was used to come up with the sample size for pupils.

The formula: $n = \dfrac{N}{1 + N(e)^2}$

Whereas: N= Target population

n=Total sample size

e = Desired margin error

Respondents' sample size for pupils

N=320 desired margin error (0.05)

$n = 320/1+320(0.05)^2 =$ **178 Pupils**

The same formula was used to calculate the sample size for teachers whose target population from the eight (8) schools was 100 teachers.

Respondents' sample size for teachers

N=100, desired margin error (0.05)

$n = 100/1+100(0.05)^2 =$ **80 Teachers.**

In the study, out of the 178 pupils that were selected, the researcher picked (6) pupils who performed well in class from each grade hence giving a total of 18 pupils per school. Since eight (8) schools were sampled, the sample size for pupils was 144 pupils and eight (8) teachers were selected from each school which gives 64 teachers. Hence, the total sample size

for the study had 208 participants; this is because there were limited resources and time for the researcher to collect data from a sample size bigger than the one used.

3.6 Sampling Techniques

The sampling technique refers to the part of the study that indicates how respondents were selected to be part of the sample and were not selected haphazardly but chosen systematically. Purposive sampling was used in the study to select pupils and teachers. As the name indicates, simple random sampling is nothing but a random selection of elements for a sample (Creswell, 2013). The sampling technique was implemented where the target population was considerably large. According to Coyne (1997), the logic and power of purposeful sampling lie in selecting information-rich cases for the study in depth.

3.7 Reliability and Validity

Reliability and validity are critical elements in research. These two elements were test in Kolmogorov-Smirnova.

3.7.1 Reliability

Reliability is generally defined as the degree to which a measure of a construct is consistent and dependable. Leedy and Ormrod (2005), further define reliability as the consistency with which a measuring instrument yields certain results when the entity being measured has not changed. The consistency of the data collection instrument was achieved through several initiatives. The researcher initially used peers to check for consistency of results. The supervisor played a pivotal role in ensuring that the consistency of the results was enhanced. The data collection instruments were also pilot tested.

3.7.2 Validity

Validity is a researcher's ability to draw meaningful and justifiable inferences from scores about a sample or population (Creswell, 2005). This is in line with Joppe (2000), who purported that validity determines whether the research truly measures that which it was intended to measure and the truthfulness of the research results. Questionnaire items were developed from the reviewed literature. A large sample that was representative of the population was used in the current study. The objectives of the current study were spelled out to enable credible results. The researcher designed questionnaires with items that were clear

and used the language that was understood by all the participants. The questionnaires were given to the supervisors to check for errors and vagueness.

3.8 Pilot Study

Before the study was carried out, the items on the questionnaire were tested to avoid ambiguity and to test for validity and reliability. This was done through a pilot study that was carried out before the actual collection of the data and it had 30 participants. A pilot study can be defined as a small scale version or trial run in preparation for a major study (Polit & Beck, 2004). Such a trial run may have various purposes such as testing study procedures, validity of tools, estimation of the recruitment rate, and an estimation of parameters such as the variance of the outcome variable to calculate sample size (Arain, Campbell, Cooper & Lancaster, 2010).

3.9 Data Collection Procedure

The researcher had an official introductory letter from the Directorate of Research and Graduate Studies at the University of Zambia (UNZA) for identification purposes.

3.10 Research Instruments

The study used questionnaires and observation methods to collect data from the respondents. The reasons why the researcher preferred questionnaires over other instruments are highlighted below. Baker (2006) citing Gorman and Clayton (2005) defines observation methods as those that involve a systematic recording of observable phenomena or behaviour in a natural setting. The advantages of the observation method as a data collection instrument are that it gives direct access to research phenomena. It produces a high level of flexibility in terms of application and generates a permanent record of phenomena to be referred to later.

3.10.1 Questionnaires

Two sets of questionnaires were designed to suit participants; one for teachers and another for pupils. Questionnaires are reliable data collecting instruments when collecting data over a large sample. They equally save time; especially that time was a limiting factor in the study. The administration of the questionnaires to respondents was arrived at after creating an understanding between the researcher and the respondents, by explaining the purpose of the study. Also, the availability of many respondents at a time made it possible for the researcher

to collect data within a short period, get a high response rate and also reduce the financial expenses.

3.11 Data Analysis

3.11.1 Statistical Analysis

The analysis of data was done at the end of the data collection. The responses were categorised based on information provided by respondents. The software called Statistical Package for Social Sciences (SPSS version 20) was used to present and interpret data using frequency distribution tables, percentages, pie charts, and bar charts. The SPSS programme has the incredible capabilities and flexibility of analysing huge data within seconds and generating an unlimited range of simple and sophisticated statistical results.

3.11.2 Content Analysis

The content analysis was conducted by the researcher to determine the software tools available on the Mwabu Interactive Tablet. The purpose of content analysis was to analyse the softwares' applications that have been integrated with the learning materials which are in line with the Zambian curriculum for grade five, six and seven. The aim of conducting a content analysis was to determine the teaching and learning materials integrated with the Mwabu interactive tablet.

3.12 Ethical Considerations

At the heart of every research conducted within the area of social science are the ethical considerations made by the researcher (Saunders *et. al*, 2009). According to Saunders (2009), ethics are the moral choice that affects decisions and behaviour in connection to those who form the subject of a study. In the study, the ethical considerations adopted are those of Rubbin and Babbie (1997) which states that participation in research should be voluntary and based on informed consent to ensure there is no harm to the participant as well as being anonymous, and confidential.

To ensure voluntary participation and informed consent by participants, the researcher shared a consent form that included information on the purpose of the study. To safeguard the participant and ensure that no harm can affect the participant, the researcher observed the

physical and psychological comfort of the participant. To ensure the autonomy of the participants, the researcher ensured no names were included anywhere in the questionnaires.

Ethical consideration made by Rubbin and Babbie (1997) on participants' behaviour is the way data is analysed and reported to the research community. Part of the researcher's core values was to ensure that the report was an honest and open account of the research process including the problems faced during the field study phase; and by doing this the researcher promoted transparency and accountability. Additionally, ethical clearance was obtained from UNZA Humanities Research Ethics Committee, and information was collected thereafter.

3.13 Summary

The study was quantitative employing a descriptive research design. The study site was done in eight (8) selected private primary schools of Lusaka district with a total sample size of 208 participants; 64 teachers, and 144 pupils. The sample size was selected using purposive sampling techniques. The data collection tool included a structured questionnaire. The instruments were pre-tested in the pilot study. Data was analysed using Statistical Package for Social Sciences (SPSS version 20) and content analysis. The next chapter presents the findings of the study.

CHAPTER FOUR: RESULTS

4.1 Overview

The previous chapter provided the methodology employed for the collection and analysis of data in the study. This chapter presents the results on the usefulness of the Mwabu interactive tablets in facilitating teaching and learning activities. The key respondents are teachers and pupils selected from eighty private schools of Lusaka District. The results are presented in line with the three research objectives outlined in chapter one of the dissertation. These research objectives are:

i.   To explore how the Mwabu interactive tablets are utilised by teachers and pupils,

ii.   To determine the teaching and learning materials integrated with the Mwabu interactive tablet,

iii. To examine the perceived usefulness of teaching and learning materials integrated with the Mwabu interactive table

In this study, 64 teachers and 144 pupils were sampled giving a total of 208 questionnaires that were distributed. A total of 168 (81%) fully completed questionnaires were returned of which 57 (89%) were filled by teachers and 111 (77%) by pupils respectively. This gave a response rate of 81% as illustrated in Table 1 below.

Table 1: Questionnaire Return Rate

Respondent category	Sampled	Returned	Percentage
Teachers	64	57	89
Pupils	144	111	77
Total	**208**	**168**	**81**

4.1 Demographic Characteristics of the Respondents

To analyse the demographical data of this study, frequency tables and charts were produced using the software programme Statistical Package for Social Sciences (SPSS version 20) and it covered information concerning the respondents' gender distribution, education level, age

distribution, and work experience. The background information is necessary for understanding the dynamics of respondents.

In Table 2 below, the researcher employed a normality test for the internal consistency of data. The results showed that the normality test for intention to use was 0.000, perceived usefulness was 0.000, perceived ease of use was 0.000, indicating the internal consistency of data was good; of the subjective norm was 0.000, voluntariness was 0.020, of output quality was 0.011, indicating excellent; job relevance was 0.000, of image was 0.000 indicating good; and of result demonstrability was 0.000 indicating good.

Table 2: Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Variables	**Statistic**	**df**	**Sig**	**Statistic**	**df**	**Sig**
INT	.225	57	.000	.851	57	.000
PU	.284	57	.000	.797	57	.000
PEU	.211	57	.000	.903	57	.000
SN	.194	57	.000	.909	57	.000
V	.165	57	.001	.950	57	.020
I	.200	57	.000	.908	57	.000
JR	.348	57	.000	.784	57	.000
OQ	.167	57	.000	.944	57	.011
RD	.185	57	.000	.906	57	.000

a. Lilliefors Significance Correction

4.1.1 Gender Distribution.

To assess the proportion of male and female respondents, the frequency of each gender was calculated, Tables 3 gives a summary of the findings for both teachers and pupils respectively.

Table 3: Teachers and Pupils' Gender

Teachers			Pupils		
Gender	Frequency	Percentage	Gender	Frequency	Percentage
Male	25	44	Male	54	49
Female	32	56	Female	57	51
Total	**57**	**100**	**Total**	**111**	**100**

The data in Table 2 above shows 32 (56%) female teachers compared to male teachers 25 (44%) who took part in the study. The findings also show a small disparity in the response and completion of the questionnaires among the pupils. This was the case with 57 (51%) female pupils as compared to the male pupils who were 54 (49%).

4.1.2 Age of Respondents

4.1.2.1 Teachers Age

Age in some researches plays a vital role in determining the outcome or influencing the findings. Figure 2 below shows the distribution of respondents by age. The results show that out of the 57 teachers, 5 (9%) were less than 20 years, 16 (28%) were aged between 20-29 years, 23 (40%) were aged between 30-39 years, and 13 (23%) were aged 40 years and above.
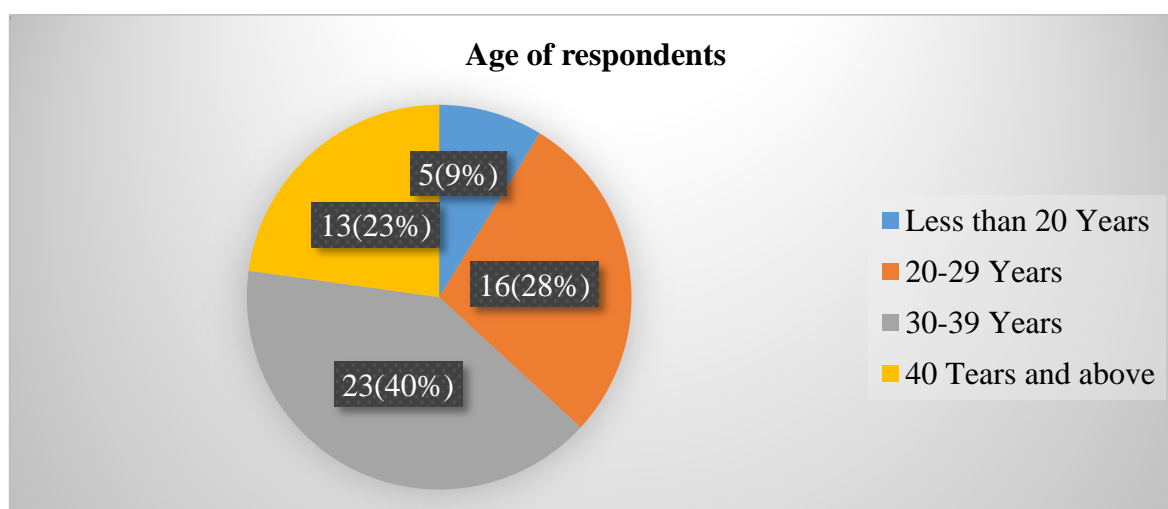
Figure 2: Teachers' Age in Years

4.1.2.2 Pupils Age

Table 3 below shows that 49 (44%) were aged 12 years, 27 (24%) were aged 13 years, 16 (14%) were aged 11 years, 11 (10%) were aged 10 years, 7 (6%) were aged 14 years and those aged 15 years and above were the least represented 2 (2%).

Table 4: Pupils' Age in Years

Variables	Pupils Age	
	Frequency	**Percentage**
10 years	11	10
11 years	16	14
12 years	49	44
13 years	27	24
14 years	7	6
15 years and above	2	2
Total	**111**	**100**

4.1.3. Level of Education of Respondents

In Table 5 below, pupils were asked to state their grade, out of the total number of pupils who were 111, 23 (21%) were in grade five, 37 (33%) were in grade six and 51 (46%) were in grade seven.

Table 5: Pupils Level of Education

Variables	Distribution of Academic Qualification	
	Frequency	**Percentage**
Grade 5	23	21
Grade 6	37	33
Grade 7	51	46
Total	**111**	**100**

In Table 6 below, teachers were asked to state their highest level of qualifications, out of the total number of teachers who were 57, 11 (19.3%) were certificate holders, 24 (42.1%) were

diploma holders, 19 (33.3%) were degree holders, 3 (5.3%) had Master's degrees and none of the respondents had a PhD.

Table 6: Teachers' Level of Education

Variables	Distribution of Academic Qualification	
	Frequency	**Percentage**
Certificate	11	19.3
Diploma	24	42.1
Degree	19	33.3
Master's degree	3	5.3
PhD	0	0
Total	**57**	**100**

4.1.4 Teachers' Working Experience

The respondents were asked to state their working experience in years; Table 6 gives a summary of the findings. According to the findings of the study in Table 7 below, teachers had different working experiences, with the majority 21 (37%) having 5-8 years of working experience. The next big share had 1-4 years of working experience forming 14 (25%). The other one had 9-12 years of work experience forming 11 (19%), 1 year was forming 7 (12%) and the least was 12 years and above had 4 (7%).

Table 7: Work Experience

Variables	Teachers Work Experience	
	Frequency	**Percentage**
1 year	7	12
1-4 years	14	25
5-8 years	21	37
9-12 years	11	19
12 years and above	4	7
Total	**57**	**100**

4.1.5 Teachers Experience Working with Computers

Figure 3 below depicts that 2 (3%) respondents had less than 1-year experience of working with computers, 7 (12%) had 1-2 years' experience working with computers, 18 (32%) had 3-4 years' experience working with computers and 30 (53%) had more than 5 years of experience working with computers.
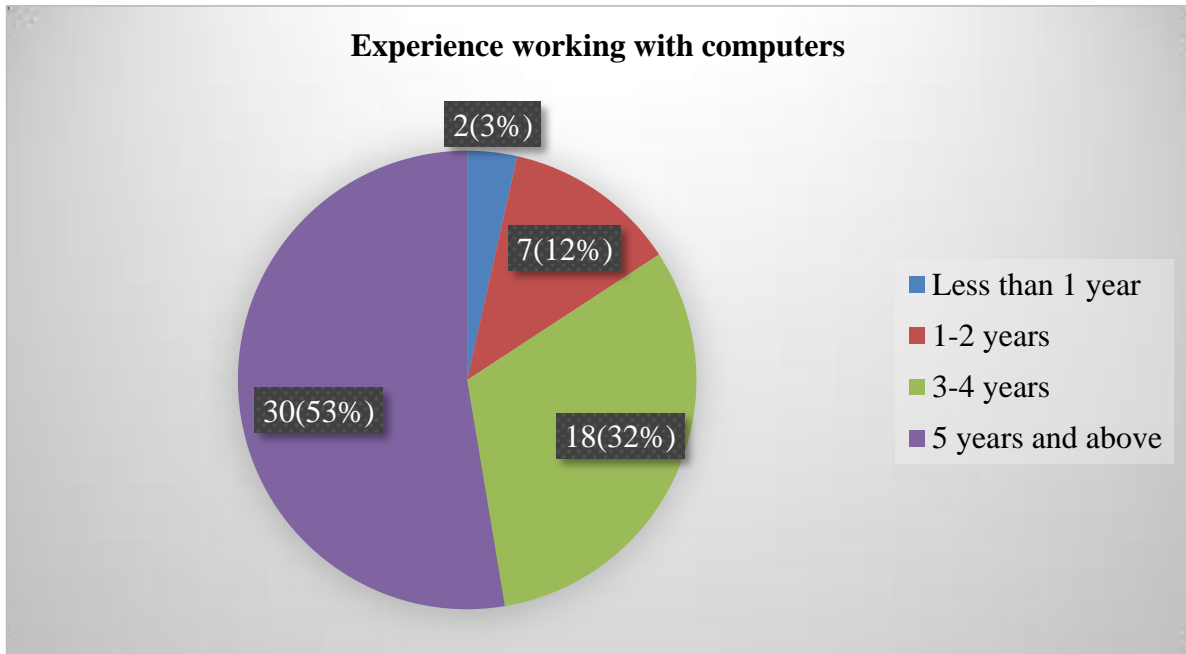
Figure 3: Teachers Experience Working with Computers

4.1.6 Teachers' Experience in the Use of Mwabu Interactive Tablet as a Teaching and Learning Tool

The respondents were asked to state how many years they had been using the Mwabu interactive tablet. Table 8 gives a summary of the findings.

Table 8: Teachers' Experience in the Use of Mwabu Interactive Tablet

Variables	Frequency	Percentage
Less than 1 year	8	14
1-2 years	14	25
3-4 years	24	42
5 years and above	11	19
Total	**57**	**100**

The majority of the respondents 24 (42%) had 3-4 years of work experience, The next had 1-2 years of work experience forming 14 (25%), the other one had 5 years and above work experience forming 11 (19%) and the least was less than 1-year work experience forming 8 (14%).

4.2 Usage of Mwabu Interactive Tablet by Teachers and Pupils

The first research objective of the study was to explore how the Mwabu interactive tablets are utilised by teachers and pupils in selected private schools of Lusaka District. To establish this, a series of questions were asked.

4.2.1 Pupils Access to Mwabu Interactive Tablet

Pupils were asked to state if they own Mwabu interactive tablets or if they have access to the ones for the school. The results in Figure 4 below shows that 67 pupils representing (60%) said that they own Mwabu interactive tablets while 44 pupils representing (40%) said that they have access to the ones for the school.
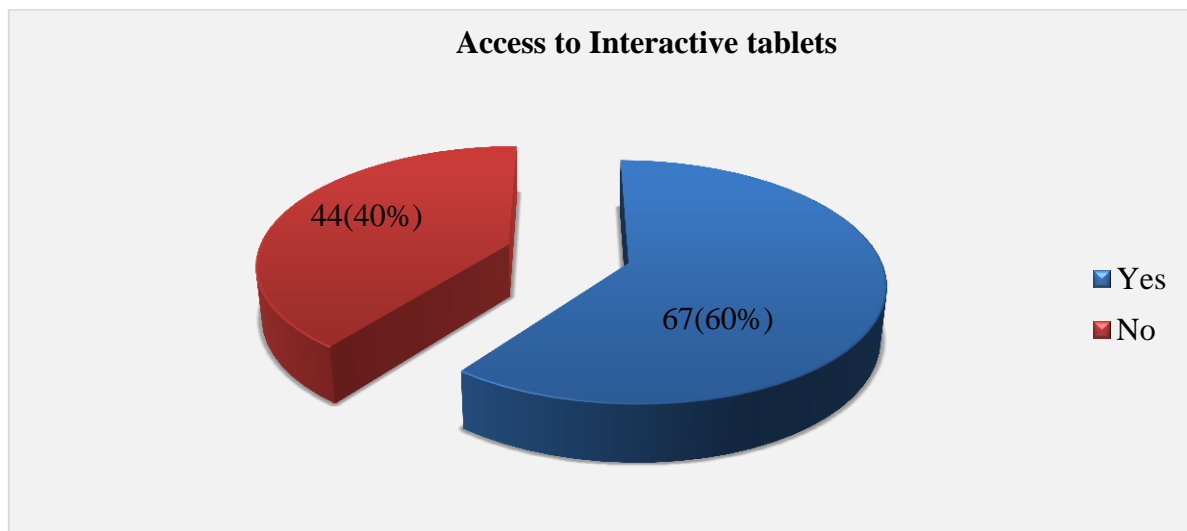
Figure 4: Access to the Mwabu interactive Tablet

4.2.2 Ease of Use of Mwabu Interactive Tablets

Pupils were asked if the Mwabu interactive tablets are easy to use for school-related activities. Table 8 below shows that 58 (52%) strongly agreed that Mwabu interactive tablets were easy to use. In the same vein, 40 (36%) agreed that Mwabu interactive tablets were ease to use 8 (7%) disagreed and indicated that Mwabu interactive tablets were not ease to use and 5 (5%) strongly disagreed saying that Mwabu interactive tablets were not ease to use.

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Table 9: Mwabu Interactive Tablets Ease to Use

Variables	Frequency	Percentage
Strongly Agree	58	52
Agree	40	36
Disagree	8	7
Strongly disagree	5	5
Total	**111**	**100**

4.2.3 Frequency of Using Mwabu Interactive Tablet for School-related Activities.

The respondents were asked to indicate how often they use Mwabu interactive tablets for school-related activities. Table 10 and 11 gives a summary of the findings.

Table 10: Pupils Frequency of Using Mwabu Interactive Tablet

Variables	Frequency	Percentage
Every lesson	18	16
Often, but not for every lesson	50	45
Sometimes in some lessons	38	34
Never	5	5
Total	**111**	**100**

The findings from Table 10 above, indicated that 18 pupils representing (16%) used Mwabu interactive tablets for every lesson, 50 pupils representing (50%) used Mwabu interactive tablets often, but not for every lesson, 38 pupils representing (34%) used Mwabu interactive tablets sometimes in some lessons and 5 (5%) said they have never used the Mwabu interactive tablet in any lesson.

Table 11: Teachers Frequency of Using Mwabu Interactive Tablet when Facilitating the Teaching and Learning Activities

Variables	Frequency	Percentage
Always	20	35
Very Frequently	16	28
Occasionally	10	18
Rarely	8	14
Never	3	5
Total	**57**	**100**

The findings obtained in Table 11 shows that 20 teachers (35%) use Mwabu interactive tablets always, 16 (28%) use Mwabu interactive tablets very frequently, 10 (18%) use the Mwabu interactive tablet occasionally, 8 (14%) use Mwabu interactive tablets rarely and 3 (5%) had never used the Mwabu interactive tablet when facilitating the teaching and learning activities.

4.2.4 The Extent of Using Mwabu Interactive Tablets by Teachers

The respondents were asked to state the usage of the Mwabu interactive tablet by ticking the following responses: research, reading and listening to books, taking quizzes, preparing a lesson plan, and note-taking. Table 12 and 13 gives a summary of the findings.

Table 12: Usage of Mwabu Interactive Tablet by Teachers

Variables	Responses			
	Never	**Not Often**	**Often**	**Very Often**
Research	7(12.3%)	12(21.0%)	14(24.6%)	24(42.1%)
Reading and listening to books	6(10.5%)	11(19.2%)	27(47.4%)	13(22.8%)
Taking quizzes	9(15.8%)	7(12.3%)	26(45.6%)	15(26.3%)
Preparing a lesson plan	11(19.3%)	13(22.8%)	9(15.8%)	24(42.1%)
Note taking	15(26.3%)	24(42.1%)	10(17.5%)	8(14.0%)

Results from Table 12 above, shows that 24 (42.1%) teachers used the Mwabu Tablet often for research, 27 (47.4%) often for reading and listening to books, 26 (45.6%) often for taking quizzes, 24 (42.1%) very often for preparing a lesson plan and 24 (42.1%) often for note-taking.

Table 13: Usage of Mwabu Interactive Tablet by Pupils

Variables	Responses			
	Never	**Not Often**	**Often**	**Very Often**
For reading and listening to stories	28(25.2%)	30(27.0%)	35(31.5%)	18(16.2%)
For playing games	18(16.2%)	26(23.4%)	38(34.2%)	29(26.1%)
For calculations	21(18.9%)	27(24.3%)	34(30.6%)	29(26.1%)
For spellings	24(21.6%)	27(24.3%)	32(28.8%)	28(25.2%)
For tests and quizzes	20(42.3%)	33(29.7%)	47(18.0%)	11(9.9%)
Note taking	45(40.5%)	27(24.3%)	21(18.9%)	18(16.2%)
For homework	15(13.5%)	25(22.5%)	37(33.3%)	34(30.6%)

Table 13 above, shows that 35(31.5%) use the Mwabu interactive tablets often for reading and listening to stories, 38(34.2%) often for playing games, 34(30.6%) often for calculations, 32(28.8%) pointed out that they use the Mwabu interactive tablets often for spellings, 47(42.3%) they often use it for tests and quizzes and 34(30.6%) they use the Mwabu interactive tablets very often for homework.

4.3 Usefulness of Mwabu Interactive Tablets in Facilitating Teaching and Learning Activities

The respondents were asked if Mwabu interactive tablets are useful in facilitating teaching and learning activities. As indicated in the Table 14, 17 (30%) teachers strongly agreed, 23 (40%) agreed, 10 (18%) teachers disagreed and a further 7 (12%) teachers strongly disagreed that the Mwabu interactive tablets are useful in facilitating teaching and learning activities. Forty-nine pupils representing (44%), strongly agreed that the Mwabu interactive tablets are useful in facilitating teaching and learning activities, 38 (34%) pupils agreed, 15 (14%) pupils disagreed that Mwabu interactive tablets are useful in facilitating teaching and learning activities and a further 9 (8%) pupils strongly disagreed.

Table 14: Usefulness in Facilitating Teaching and Learning Activities

Teachers			Pupils		
Variables	Frequency	Percentage	Variables	Frequency	Percentage
Strongly agree	17	30	Strongly agree	49	44
Agree	23	40	Agree	38	34
Disagree	10	18	Disagree	15	14
Strongly disagree	7	12	Strongly disagree	9	8
Total	**57**	**100**	**Total**	**111**	**100**

4.4 Content Analysis on Mwabu Interactive Tablets

The second objective was to determine the teaching and learning materials integrated into the Mwabu interactive tablets. This objective was achieved through analysing the materials that have been integrated on the Mwabu interactive tablet. Content analysis is carried out by grouping data under specific concepts and themes in a meaningful way and then interpreting it (Yıldırım & Simsek, 2013). First and foremost, Mwabu interactive tablets are comprehensive e-learning tablets that are pre-loaded with iSchool learning material that have animated lessons with illustrated stories. The Mwabu interactive tablets have colourful and interactive pre-grades to grade seven lessons that follow the Zambian curriculum. They have stories for learning and fun, plus Mwabu reading schemes. At the end of every lesson plan, there are quizzes and grade seven examination questions and answers for the child's self-assessment.

The Mwabu interactive tablets have lesson plans that cover every subject in primary school from grade 1 to 7 for the entire Zambian curriculum which are; Mathematics, Literacy and Language, English language, Creative and Technology Studies, Social Studies, and Integrated Science. These are all voiced and written in English and eight (8) local languages for grade 1 to 3 which are; Bemba, Kaonde, Lunda, Lozi, Luvale, Nyanja (Standard), Tonga and Lusaka Nyanja. The materials are designed for pupils and teachers when using the tablets for lessons

and this works very well for larger class sizes and ensures that teachers can work more closely with each pupil.

The materials in the Mwabu interactive tablets can be accessed without using the Internet. The interactive tablets have primary school multimedia lessons, and the touch-screen tablet includes a pre-loaded version of Wikipedia and other child-friendly apps. It has continuous professional development and teacher training modules and this is because it allows for easier storage of data like registration of pupils in class using spreadsheets. With the Mwabu tablet, a school can operate with minimal resources and facilities. The Mwabu interactive tablet has seven application software where the teaching and learning materials are integrated for teachers and pupils to make use, and these are; Droppy, Game rangers international, Mwabu, iFarm, Reading scheme, Exam practice, and Wikipedia for school. The material that has been integrated helps to broaden the range of pedagogical methods available to teachers while driving engagement and greater understanding among learners.

4.4.1 Droppy

It contains animated lessons with illustrated stories about having access to clean water. Children are taught to wash their hands before eating anything like fruits, wash their hands after using the toilet, and drink clean water to avoid stomach illnesses. It also shows pictures of contaminated water in the community.

4.4.2 Game Rangers International

The game rangers' international application has teaching and learning materials that have animated lessons with illustrated stories about game rangers, how they manage the animals in the game park, and pupils can also listen to the story about the animals found in the game park.

4.4.3 Mwabu

The Mwabu application has subjects for grade one which are Mathematics, Literacy and Language, English language, Creative and Technology Studies, Social Studies, and Integrated Science. The Mwabu application has sound stories with images which helps the pupil and teacher to select the language they would want to use when listening to the stories. Creative and technology studies contain the following materials: Constructional craft, drawing and colouring, patterns, sound, designing, fundamental movements, and safety. Mathematics also

has addition, number patterns, subtraction, sets, number and notation plane shapes, and measures. Integration science has plants and animals, the human body, the environment, materials and energy, and health. The English language also has listening and speaking, writing and reading. Social studies have Christian living, religion, living together, and transport and communication. The Mwabu application also allows teachers and pupils to research in their respective subjects.

4.4.4 iFarm

iFarm is an application that has animated lessons with illustrated stories of livestock where different animals and plants are given their names. It also gives a story of how animals and plants grow and how human beings should look after them. iFarm also provides key information to small-scale and subsistence farmers on all major livestock and crops to enhance productivity and diversity of crops.

4.4.5 Reading Scheme

The reading schemes have a reading level from grade 1 to 7 and each number is labelled with a colour where the pupil can select the colour and read stories. For example, 1 is red and 2 is pink.

4.4.6 Exam Practice

The exam practice application on the Mwabu interactive tablet has examination questions in the following subjects: Mathematics, Literacy and Language, Creative and Technology Studies, Social Studies, Science, and lastly Special papers. A pupil can choose the subject he/she wants to study by answering the questions. After answering the questions, the system will automatically mark the pupil so that the pupil can know the marks he/she has scored. This helps the pupil to improve on their performance when they see their results.

4.4.7 Wikipedia for School

Wikipedia for Schools is one of the applications where teachers and pupils can select articles from Wikipedia produced by international children's charity SOS Children and most recently updated in 2013. It was originally produced as a learning resource for schools in countries where Internet access is limited, though it has also enjoyed significant success in the developed world. The Wikipedia for Schools contains 6,000 articles comprising 26 million words, as well as 50,000 images.

4.5 Usage and Perceived Usefulness of Mwabu Interactive Tablets

The third objective was to determine the perceived usefulness of the Mwabu interactive tablets. The study provided simple descriptive statistics about data because it's an easy and quick way to understand the natural component of the data, such as the central tendency in the data, or information about the population that is being studied.

4.5.1 Descriptive statistics

Table 14 below demonstrates the descriptive statistics for each construct. Both Mean and Standard Deviation were provided. There has been a debate over presenting descriptive statistics for scales. To make it clear, in this research, the researcher used a five-point Likert Scale: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. The following table shows the percentage of teachers (out of 57 respondents) and their respective responses to specific questions.

Table 15: Descriptive Analysis for the Constructs

Constructs	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
PU	57	1.25	5.00	4.0439	.76637
Valid N (list wise)	**57**				

Table 15 above shows that the concept yielded 57 valid responses (N=57). Perceived usefulness (PU) receives a mean of 4.0439 and a standard deviation of 0.76637. The mean perceived usefulness (PU) revealed that most respondents strongly agreed that they can use the Mwabu interactive tablet, the tablet was useful as a tool for learning activities and lastly that was easy to use.

4.5.2 Chi-square Test of the Perceived Usefulness and Teachers' Experience of Using the Mwabu Interactive Tablets

Table 16 below shows a chi-square test that was conducted to establish if there was a relationship between perceived usefulness and teachers' experience of using the Mwabu interactive tablet.

Table 16: Chi-square Test on perceived usefulness and Teachers' Working Experience

Variables	Observed N	Expected N	Residual
Strongly disagree	1	11.4	-10.4
Disagree	3	11.4	-8.4
Neutral	5	11.4	-6.4
Agree	37	11.4	25.6
Strongly agree	11	11.4	-.4
Total	**57**		

In this study, the researcher examined the relationships between perceived usefulness, and teachers' experience of using the Mwabu interactive tablet. The researcher also explored the forms of these relationships. To maximise the accuracy of the findings, the formulated plan of analysis was set at a significance level of 0.05. With this analysis, if the test statistical probability (p=value) was less than the significance level, the null hypothesis would be rejected. Conversely, if the p-value will be greater than 0.05, then the null hypothesis would be accepted. The results of the analysis are presented below.

1. H_0 = There was no positive relationship between perceived usefulness and teachers' use of the Mwabu interactive tablet

2. H_1 = There was a positive relationship between perceived usefulness and teachers' use of the Mwabu interactive tablet

4.5.3 Chi-Square of Degree of Association

Since the p=value is less than the agreed significance level, the null hypothesis is rejected. The interpretation of the results is that there was a positive relationship between perceived usefulness and teachers' experience of using the tablet. The results from the Chi-square of Degree of Association indicate that there was a correlation between the two variables and this was because the statistical significance level which was set at $p < 0.05$ was less than that of the agreed significance level. This implies that there is a correlation between perceived usefulness and teachers' working experience

Table 17: Chi-Square of degree of association

Test Statistics	
	Perceived usefulness
Chi-Square	76.772[a]
Df	4
Asymp. Sig.	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 11.4.	

4.6 Summary

This chapter presented the results of the study on the usefulness of Mwabu interactive tablets in selected private schools of Lusaka district. The results have been presented in line with the three objectives of the study and the results show that the majority of teachers 23 (40%) agreed and 49 (44%) pupils strongly agreed that the Mwabu interactive tablets was useful for teaching and learning activities. The findings also revealed that 35 (31.5%) use the Mwabu interactive tablets often for reading and listening to stories, 38 (34.2%) often for playing games, 34 (30.6%) often for calculations, 32 (28.8%) pointed out that they use the Mwabu interactive tablets often for spellings, 47 (42.3%) they often use it for tests and quizzes and 34 (30.6%) they use the Mwabu interactive tablets very often for homework. The researcher revealed that Mwabu interactive tablet has seven application soft-wares were the teaching and learning materials were integrated for teachers and pupils. Chapter five discussed the findings of the study.

CHAPTER FIVE: DISCUSSION

5.1 Overview

This chapter discusses the findings that have been presented in chapter four. The discussion highlights the significant aspects based on the following research objectives:

i. To explore how the Mwabu interactive tablets are utilised by teachers and pupils,

ii. To determine the teaching and learning materials integrated with the Mwabu interactive tablets,

iii. To examine the perceived usefulness of teaching and learning materials integrated with the Mwabu interactive tablets

5.1.1 Background Information of respondents

The first five items of the questionnaire sought background information from the respondents. The information which was sought included, gender, age, academic qualifications as well as work experience. This information was essential because understanding the usefulness of Mwabu interactive tablets in facilitating teaching and learning activities depends upon knowing the academic qualifications and experiences of the respondents.

According to the findings, there was a disparity in response with female teachers compared to male teachers. This shows that most of the private primary schools had female teachers. The findings revealed a small disparity in the response with female pupils compared to the male pupils. The findings also revealed that the majority of the teachers were aged between 30-39 years and the majority of the pupils were 12 years.

The study discovered that out of 111, the majority were grade seven. The study also established that the majority of teachers were diplomas. This means that most of the private primary schools had employed diploma holders. Concerning the length of work experience among the teachers, the majority were between 5-8 years of working experience. Concerning the experience in using the Mwabu interactive tablet in facilitating teaching and learning activities in schools, the study revealed that many of the teachers had 3-4 years of experience in using the Mwabu interactive tablets.

5.1.2 Usage of Mwabu Interactive Tablet by Teachers and Pupils

The study revealed that the majority of the pupils 67 (60%) own Mwabu interactive tablets while 44 (40%) pupils have access to the ones for the school. Furthermore, the study discovered that 58 (52%) pupils strongly agreed that Mwabu interactive tablets were easy to use. The study has shown that personal ownership of the Mwabu interactive tablet is crucial to reach the full potential of tablet use for teaching and learning purposes. These findings are in line with Perry (2003), who claims that ownership of a device creates a sense of belonging, comfort and commitment, and it is only then pupils engage with their devices to discover their real potential. Foote (2012) describes experiences from her own school, where pupils alike were given individual tablets. After a year of use, she says: "it's clear that the devices have changed a lot about how our school works" (p. 26). The tablet is an all-in-one tool, where pupils plan, produce, take notes and save material etc. Maintaining an overview is easy, it is easy to carry around, and the pupils are more creative.

The study discovered that personal ownership of a tablet was the most important factor for the successful use of Mwabu interactive tablets. This was seen as critical for increasing pupil motivation, promoting greater pupil autonomy and self-efficacy, and encouraging pupils to take responsibility for their learning. Mock (2004) also suggested that teachers were using the tablet as a brainstorming tool instead of pupils coming up to the board or the teacher writing on the board; the teacher could pass the tablet around the class and the pupils could write on the tablet, sharing everyone's ideas via the data projector and promoting collaboration among pupils.

Additionally, the findings of this study authenticate earlier findings by Rikala and Vesisenaho (2013), were two primary schools in Chicago and Fairfax County in the United States of America discovered that having personal access to tablets made a significant impact on children's ability to access learning material outside school, especially for children who previously had to share devices at home. These findings are also confirmed by Fisher (2013), who observed that pupils use technology far more often after receiving a personal digital tool than when they have had to stick to the school classroom or computer lab.

In a similar study by Becta (2003), supports the researcher's findings and claims that ownership of a tablet creates a sense of belonging, comfort, and commitment, and it is only then pupils engage with their tablets to discover their real potential and also having the freedom to explore and do whatever they need to do.

5.1.3 Frequency of Using Mwabu Interactive Tablet

The study revealed that the majority of pupils 50 (50%) were using the Mwabu interactive tablets often, but not for every lesson, and the many of the teachers 20 (35%) were using Mwabu interactive tablets always. In a similar study done by Miller (2012), it was discovered that 209 primary schools were using the tablets often for learning purposes. Nguyen (2014) also reported that interactive tablets are often used successfully for a variety of purposes in higher education. This shows that teachers and pupils had the desire to use the Mwabu interactive tablet most of the time.

5.1.4 The Extent of Using Mwabu Interactive Tablets

The study established that many teachers often use the Mwabu interactive tablet for reading and listening to books. Furthermore, the study revealed that the many pupils (42.3%) often use the tablets for tests and quizzes. The finding validated that of Chou (2012), who observed that it is easy and convenient to use tablets for tests and quizzes and instructors can then provide immediate feedback to pupils electronically. A study by Seferoglu (2011), also revealed that tablet computers were often used for extracurricular purposes such as games, music and entertainment, both in and out of class. This shows that teachers and pupils were using the Mwabu interactive tablet for school related activities.

Similarly, Hutchison (2013) in the United States revealed that many pupils were using their tablets to take notes in class or conferences and that they could then choose these notes to their laptop or desktop computers and smartphones. These findings are similar to Beschorner and Hutchison (2013), who concluded that tablets can be used effectively as a tool that pupils can navigate and use independently to develop literacy skills. The research finding of the study further agrees with the results of Ifenthaler and Schweinbenz (2013) who observed that the from instructional point of view beneficial features of tablets range from the availability of tools such as simulations, cameras and microphones, to eBooks and digital textbooks, to interactive learning networks and instant feedback.

5.2 Chi-square Test of Association on the Perceived Usefulness of Mwabu Interactive Tablet

Technology has played a key role in various learning activities within the classroom, changing the ways of teaching and learning which have taken place in most learning

institutions as well as having a real impact on learning (Driscoll, 2007). The study revealed that Technology Acceptance Model (TAM-2) is an information system theory that models how users come to accept and use technology. The use of the Mwabu interactive tablet has shown positive relationships between the technology and achievement in technology if used properly. The following construct was discussed concerning the usage and perceived usefulness of the Mwabu interactive tablet. The study discovered that there was a correlation between perceived usefulness and teachers' working experience.

5.2.1 Perceived Usefulness

The study established that the construct perceived usefulness (PU) had also the highest mean indicating that the majority of the respondents strongly agree that the Mwabu interactive tablet is useful in facilitating teaching and learning activities. In the study conducted by Shurtz, Halling, and Mckay (2011), pupils expressed that tablets are useful in increasing their level of information on lessons, their communication with other pupils, and their motivation towards lessons. Nguyen (2014), reports that the tablets were found to be useful for taking notes, taking pictures, communication, collaboration, sharing learning material, and receiving feedback, all of which enhanced group work. In addition, Loudina (2007), suggested that the tablets were useful in subjects like Maths and Science where the use of a pen has considerable advantages over a mouse.

5.3 Content Analysis on Mwabu Interactive Tablet

The study discovered that the Mwabu interactive tablets were comprehensive e-learning tablets that were pre-loaded with iSchool learning materials that had animated lessons with illustrated stories. The Mwabu interactive tablets had colourful and interactive pre-grades to grade seven lessons that follow the Zambian curriculum. They had stories for learning and fun, plus Mwabu reading schemes. At the end of every lesson plan, there were quizzes and grade seven examination questions and answers for the pupil's self-assessment. A similar study done by Albion (2002), pointed out that the use of tablets helped to create more effective presentations for pupils and several tablets could be synced together to enhance group presentations among pupils. Similarly, Russell (2013), observed that different apps can facilitate presentations for teachers and pupils.

The study revealed that the Mwabu interactive tablets had lesson plans that covered every subject in primary school from grade 1 to 7 for the entire Zambian curriculum which were;

Mathematics, Literacy and Language, English language, Creative and Technology Studies, Social Studies, and Integrated Science. These were all voiced and written in English and eight (8) major local languages for grades 1 to 3 which were; Bemba, Kaonde, Lunda, Lozi, Luvale, Nyanja (Standard), Tonga, and Lusaka Nyanja. The materials were designed for pupils and teachers when using the tablets for lessons and this worked very well for larger class sizes and ensured that teachers can work more closely with the pupil.

The findings of the study revealed that the Mwabu interactive tablets had primary school multimedia lessons and the touch-screen tablet which included a pre-loaded version of Wikipedia and other child-friendly apps. It had continuous professional development and teacher training modules and this is because it allowed for easier storage of data like registration of pupils in class using spreadsheets. With the Mwabu interactive tablets, schools can operate with minimal resources and facilities.

Furthermore, the study discovered that the Mwabu interactive tablet had seven applications software where the teaching and learning materials were integrated for teachers and pupils to make use of, and these were: Droppy, Game rangers international, Mwabu, iFarm, Reading scheme, Exam practice, and Wikipedia for school. A similar study done by Nguyen and Barton (2014), observed that many apps facilitate teaching and learning and these were apps for email, web browsing, calendar, e-books, games, multimedia, writing, presentation, social media, video conferencing, and cloud storage. Mock (2004), suggested that the tablet had unlocked the user's capability to use a number of different apps which in turn had given the user the ability to learn new skills or improve those ICT skills already learned.

The findings of the study revealed that the application droppy contains animated lessons with illustrated stories about having access to clean water where children were taught to wash their hands before eating anything like fruits, wash their hands after using the toilet, and drink clean water to avoid stomach illnesses. It also showed pictures of contaminated water in the community. The study also indicated that there was game rangers' international application that had teaching and learning materials that had animated lessons with illustrated stories about game rangers, how they manage the animals in the game park, and pupils can also listen to the story about the animals found in the game park.

The findings of the study were also similar to those unveiled by Beach (2013), who propounded that there are many educational games (serious games) available for tablet computers and some of these games are available for free download and pupils might also

choose to download and play serious games on their tablets as an extra learning resource. This shows that the study established that the Mwabu application had sound stories with images which helped the pupil and teacher to select the language they would want to use when listening to the stories.

The findings of the study revealed that the reading schemes had a reading level from 1 to 7 and each number was labelled with a colour where the pupil can select the colour and read stories. The results are also in line with McKenzie's (2010) who observed that tablets are perfect devices for reading because their screens are designed to provide a good reading experience. Study by Owens (2013), revealed that tablets are hand-held devices where one can easily take them around and hold them in the desired direction which makes reading on them very convenient. Furthermore, the report by Microsoft Corporation (2012) stated that the stylus technology allowed the pupils to use the tablet as a digital book; they could use the pen, write class notes, draw diagrams and work through equations.

Also, Falloon (2013) concluded that app design and content features on the tablets are very important in delivering instruction for pupils. The apps must appropriately communicate learning objectives, provide smooth connections to the learning goals, include understandable instructions, incorporate feedback, combine a blend of game practice and learning components, and provide interaction parameters that match the learning characteristics of the target student group. The research study has shown that the Mwabu educational tablet does not replace face-to-face teaching with e-learning, but supports classroom activities by providing comprehensive lesson plans and interactive. The material can help to broaden the range of pedagogical methods available to teachers while driving engagement and greater understanding among learners. Much of the research revealed that the most effective apps were the ones that were selected for their alignment to learning goals, highly organised and systematised scaffolding and interactive content that is age-level appropriate. The study has revealed that these apps help to provide flexible and personalised support for pupils based on their needs.

5.4 Usefulness of Mwabu Interactive Tablets in Facilitating Teaching and Learning Activities

The study revealed that a high number of teachers (40%) agreed that the Mwabu interactive tablets were useful in facilitating teaching and learning activities. Additionally, the findings revealed that many pupils (34%) also agreed that the Mwabu interactive tablets were useful in

facilitating teaching and learning activities. These findings are in line with Gahwaji (2013), who carried out a study in the United States on the role of the tablet in education and found several frequently perceived usefulness of tablets which included ease of use, suitability for anytime and anywhere learning, use for both classroom demonstrations and small group teaching activities, a wide range of educational apps, the ability to support interactive and collaborative learning, and increased communication between pupils and teachers.

This finding further corresponds with the findings of Churchill (2012), who observed that tablets were useful for e-reading, which included the ability to support pupils with literacy difficulties, including pupils for whom English was a second language. It was also found that the tablets could potentially reduce teachers' workload by enabling the digital collection and marking of assignments and providing easy content production and delivery to pupils. A study done by Ward, Finley, Keil and Clay (2013), from Washington University indicated that tablets contributed in fostering pupils' participation and their enjoyment of learning in addition to increasing building concepts among them.

5.5 Summary

The foregoing chapter has presented the discussions of the findings on the use of interactive tablets in facilitating teaching and learning activities in Lusaka District. The study has shown that personal ownership of the Mwabu interactive tablet is crucial to reach the full potential of tablet use for teaching and learning activities. The study also showed that the many teachers and pupils agreed that the Mwabu interactive tablets were useful in facilitating teaching and learning activities. Furthermore, the study established that the Mwabu interactive tablets had lesson plans that covered every subject in primary school from grade 1 to 7 for the entire Zambian curriculum which were; Mathematics, Literacy and Language, English language, Creative and Technology Studies, Social Studies, and Integrated Science. The study revealed that the many respondents strongly agreed that having access to the Mwabu interactive tablet, they intend to use, easy to use and it was perceived that the Mwabu interactive tablet is useful in facilitating teaching and learning activities.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Overview

The preceding chapter discussed the findings of the study on the usefulness of interactive tablets in facilitating teaching and learning activities in selected private primary schools of Lusaka District. This chapter presents the conclusions and recommendations of the study based on the findings. The conclusion will be made in line with the research objectives and theoretical framework as presented in chapter one. Recommendations will be divided into general recommendations as well as recommendations for future research emanating from the gaps identified during this study.

6.2 Conclusion

The first objective of the research study looked at the extent to which the Mwabu interactive tablets were utilised by teachers and pupils. The many pupils and teachers strongly agreed that the Mwabu interactive tablets were easy to use. The study further revealed that the pupils were using the Mwabu interactive tablets for every lesson at school while the majority of the teachers were always using the Mwabu interactive tablet. The study also showed that the Mwabu interactive tablet was useful in facilitating learning activities for pupils. Additional findings of this study reveal that most of the teachers and pupils were using the Mwabu interactive tablets often for reading and listening to books as well as for taking quizzes.

Concerning the second objective of the research study; the degree to which teaching and learning materials integrated into Mwabu interactive tablet, it can be concluded that the tablets had lesson plans that cover every subject in primary school from grade 1 to 7 for the entire Zambian curriculum which has Mathematics, Literacy and Language, English language, Creative and Technology Studies, Social Studies, and Integrated Science. These are all voiced and written in English and eight (8) local languages from grade 1 to 3 which are; Bemba, Kaonde, Lunda, Lozi, Luvale, Nyanja (Standard), Tonga, and Lusaka Nyanja. The materials are designed for pupils and teachers when using the tablets for lessons, and this works very well for larger class sizes and ensures that teachers can work more closely with each pupil.

The study further revealed that the Mwabu interactive tablet has seven application software where the teaching and learning materials are integrated for teachers and pupils to make use

of, and these were: Droppy, Game rangers international, Mwabu, iFarm, Reading scheme, Exam practice, and Wikipedia for school. The material that has been integrated into the Mwabu interactive tablets has helped to broaden the range of pedagogical methods available to teachers while driving engagement and greater understanding among learners.

Coming to the third objective of the research study, examining the perceived usefulness of teaching and learning materials integrated with the Mwabu interactive table, the study concluded that the concept perceived usefulness (PU), revealed that many respondents strongly agreed that they can use the Mwabu interactive tablet, the tablet was useful as a tool for learning activities and it was easy to use.

The study also established that most of the teachers strongly agreed that the Mwabu interactive tablet was useful in facilitating teaching and learning activities and was easy to use. The study discovered that perceived usefulness showed that technology is skill demanding, meaning individuals are more willing to use the systems that can achieve the same performance when they have the skills to use it.

6.3 Recommendations

Arising from the foregoing findings and conclusions, the following recommendations are made.

i. The study established how useful the Mwabu interactive tablet was in bridging the digital divide in today's information age; it is therefore, being recommended that schools should ensure that teachers and pupils should make use of the Mwabu interactive tablet in schools and this can be done through awareness activities and training.

ii. The Ministry of General Education and private schools should work hand in hand with iSchool Company who are the suppliers of Mwabu interactive tablets to make the tablet accessible to pupils and schools as well as making the tablets affordable to buy.

iii. School managers should encourage parents/guardians to buy Mwabu interactive tablets for their children so that pupils can even use them at home.

6.4 Recommendations for future research

The researcher proposes that future studies should be undertaken where surveys, interviews, focus groups, and other techniques could be used to assess the benefits and challenges of incorporating Mwabu interactive tablets in the teaching and learning processes in public schools

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APPENDICES

Appendix A: List of private primary schools that participated in the study

No	NAMES OF SCHOOLS
1	FRADON SCHOOL
2	SHAMAHLIGHT SCHOOL
3	MUSTARD SEED SCHOOL
4	SIMFEX ACADEMY
5	DESTINY SCHOOL
6	FRIENDS OF JESUS CONVENT SCHOOL
7	SUN SPRING SCHOOL
8	JOSMA TRUST SCHOOL

Appendix B: Information and Consent Form for Teachers

THE UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

I am a post-graduate student at the University of Zambia, School of education department of library and information science. I am researching **"on *the usefulness of interactive tablets in facilitating teaching and learning activities: a case study of Mwabu Interactive Tablets"***. The purpose of this study is to explore how the Mwabu interactive tablets are utilized by teachers and pupils, to determine the teaching and learning materials integrated with the Mwabu interactive tablet, and to determine the perceived usefulness of teaching and learning materials integrated with the Mwabu table You have been randomly selected to voluntarily take part in this study as one of the teachers.

Purpose of the Research
The usefulness of interactive tablets in facilitating teaching and learning activities: A case study of Mwabu Interactive Tablets

Type of Research Intervention
The research involves answering questionnaires that will be administered to you.

Participant selection
You are being invited to take part in this research because you are using the Mwabu interactive tablet and there is a need to determine the usefulness of interactive tablets in facilitating teaching and learning activities: a case study of Mwabu interactive tablets.

Voluntary Participation
Your decision to participate in this study is entirely voluntary. It is your choice whether you want to take part or not. If you choose not to consent, nothing will change. You may also choose to change your mind later and stop participating, even if you had earlier agreed, and still nothing will change.

Procedures
You are invited to participate in a research study by answering a questionnaire. You have been randomly selected and if you do not wish to answer any questions you may skip them and move to the next question. The information recorded is confidential, your name is not being included on the forms, only a number will identify you, and no one else except the Principal Investigator will have access to the survey.

Risk and discomfort
You do not have to answer any question or take part in the study if you feel the question(s) are too personal.
Reimbursements

You will not be provided any incentive to take part in the research. There may not be any benefit for you directly now but allowing your participation will help find the answer to the research question.

Confidentiality
The information that will be collected from this research project will be kept confidential. The information that will be collected from the research will be put away and no-one but the Principal Investigator will be able to see it. All information on your questionnaire will have a number on it instead of a name.

Sharing of Results
The knowledge that will be obtained from this study will be shared with you through iSchool Company. Confidential information will not be shared.

Right to Refuse or Withdraw
You do not have to agree to take part in this research if you do not wish to do so and refusing to will not affect you. You may stop participating in the research at any time that you wish.

Who to Contact
If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, please contact me on: Kadeyo Mutale Kuyela, Lusaka. Cell- 0971946568. E-mail: kadeyo94@gmail.com
This proposal or protocol has been reviewed and approved by HSSREC which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find about more about the IRB, contact:

The Chairperson,
Dr. Jason Mwanza,
Humanities and Social Sciences, Research Ethics Committee,
University of Zambia
P O Box 32379
LUSAKA

        OR
The Director
Professor. Henry M. Sichingabula
Directorate of Research and Graduate Studies
University of Zambia
P O Box 32379
LUSAKA

Section B: Certificate of Consent

I have been invited to participate in this research on *the usefulness of interactive tablets in facilitating teaching and learning activities.* A case study of Mwabu Interactive Tablets. I have read the foregoing information, or it has been read to me and I have understood it. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I will receive no payment for participating in the study. I know that my participation is anonymous and I have access to the data and records at any time. I know that I can stop my participation in this study at any time. I consent voluntarily to answer the questionnaire.

Print Name of Participant: _____

Signature of Participant: _____

Date_____

Statement by Researcher/Person taking consent

I have accurately read out the information sheet to the potential participant and the best of my ability made sure that the participant understands that the following will be done
1. Questionnaires will be administered to them
2. Their answered questionnaires will be kept as confidential documents

I confirm that the participant was allowed to ask questions about the study and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent and the consent has been given freely and voluntarily.
A copy of the ICF has been given to the participant.

Print Name of the Researcher/ person taking the consent: _____

Signature of Researcher/person taking the consent: _____

Date: _____

Contacts for Questions
Principal Investigator

Names: Kadeyo Mutale Kuyela
Phone: 0971946568/0968411711
Email: kadeyo94@gmail.com

Appendix C: Questionnaire for Teachers'

The University of Zambia

School of Education

Department of Library and Information Science

Questionnaire

Research Title:

The usefulness of Mwabu Interactive Tablets in facilitating teaching and learning activities:
A Case Study of Mwabu Interactive Tablets

Dear Respondent,

I am a Master's of Library and Information Science student at the University of Zambia, Great East Road researching the title above purely for academic purposes. Please be advised that eight (8) selected Private Primary Schools in Lusaka District are been studied. The main goal of the questionnaire is to find out the usefulness of Mwabu Interactive Tablets in facilitating teaching and learning activities.

Be assured that the information you will provide in this Questionnaire will be treated with the utmost confidentiality. Your participation will be highly appreciated.

Section A: Demographic characteristics of the respondents

The University of Zambia

School of Education

Department of Library and Information Science

Questionnaire

Research Title:

The usefulness of Mwabu Interactive Tablets in facilitating teaching and learning activities:
A Case Study of Mwabu Interactive Tablets

Dear Respondent,

I am a Master's of Library and Information Science student at the University of Zambia, Great East Road researching the title above purely for academic purposes. Please be advised that eight (8) selected Private Primary Schools in Lusaka District are been studied. The main goal of the questionnaire is to find out the usefulness of Mwabu Interactive Tablets in facilitating teaching and learning activities.

Be assured that the information you will provide in this Questionnaire will be treated with the utmost confidentiality. Your participation will be highly appreciated.

Section A: Demographic characteristics of the respondents

1. What is your gender?

    a) Male   ( )
    b) Female   ( )

2. Please indicate your age bracket.

    a) Less than 20 years   ( )
    b) 20-29 years old   ( )

c) 30-39 years old ( )

d) 40 years and above ( )

3. What is your highest level of education?

a) Certificate ( )

b) Diploma ( )

c) Degree ( )

d) Master's degree ( )

e) PhD ( )

4. How many years have you been working as a teacher?

a) Less than 1 year ( )

b) 1-4 years ( )

c) 5-8 years ( )

d) 9-12 years ( )

e) 12 year and above ( )

5. How much experience do you have working with the computers?

a) Less than 1 year ( )

b) 1-2 years ( )

c) 3-4 years ( )

d) More than 5 years ( )

Section B: Utilisation of the Mwabu Interactive Tablet by Teachers

6. How long have you been using Mwabu interactive tablet as a teaching and learning tool?

a) Less than 1 year ( )
b) 1-2 years ( )
c) 3-4 years ( )
d) 5 years and above ( )

7. How often did you use the Mwabu interactive tablets when facilitating the teaching and learning activities?

a) Always

b) Very Frequently

c) Occasionally

d) Rarely

e) Never

8. To what extent do you use the Mwabu interactive table for the following?

N0	Variables	Never	Not Often	Often	Very Often
1	Research				
2	Reading and listening to books				
3	Taking quizzes				
4	Preparing a lesson plan				
5	Note-taking				

9. To what extent is the use of Mwabu interactive tablets offer compelling benefits to teachers?

 a) Very good   ( )

 b) Good   ( )

 c) Fair   ( )

 d) Poor   ( )

 e) Very poor   ( )

10. Do you agree that the use of the Mwabu interactive tablets is useful in facilitating teaching and learning activities?

 a) Strongly Agree   ( )

 b) Agree   ( )

 c) Disagree   ( )

 d) Strongly Disagree   ( )

Section C: TAM2 Questions

11. On a scale of 1 to 5, where **1=strongly disagree, 2=disagree, 3= neutral, 4=agree, and 5= strongly agree**. How would you rate the perceived usefulness of the Mwabu Interactive Tablet?

Constructs	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Intention to Use					
Assuming I have access to the Mwabu interactive tablet, I intend to use it.					
Given that I have access to the Mwabu interactive tablet, I predict that I would use it.					
Perceived Usefulness					
Using the Mwabu interactive tablet improves my performance in my job.					
Using the Mwabu interactive table in my job increases my productivity.					
Using the Mwabu interactive tablet enhances my effectiveness in my job.					
I find the Mwabu interactive tablet to be useful in my job.					
Perceived Ease of Use					
My interaction with the Mwabu interactive tablet is clear and understandable					
Interacting with the Mwabu interactive tablet does not require a lot of mental effort					
I find the Mwabu interactive tablet to be easy to use					
I find it easy to get the Mwabu interactive tablet to do what I want it to do.					
Subjective Norm					
People who influence my behaviour think that I should use the Mwabu interactive tablet.					
People who are important to me think that I should use the Mwabu interactive tablet.					
Voluntariness					
My use of the Mwabu interactive tablet is voluntary					

Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My school manager does not require me to use the Mwabu interactive tablet					
Although it might be helpful, using the Mwabu interactive tablet is certainly not compulsory in my job					
Image					
People at our school who use the Mwabu interactive tablet have more prestige than those who do not					
People at our school who use the Mwabu interactive tablet have a high profile					
Having the Mwabu interactive tablet is a status symbol at our school.					
Job Relevance					
In my job, the usage of the Mwabu interactive tablet is important.					
In my job, the usage of the Mwabu interactive tablet is relevant.					
Output Quality					
The quality of the output I get from the Mwabu interactive tablet is high.					
I have no problem with the quality of the Mwabu interactive tablet output.					
Result Demonstrability					
I have no difficulty telling others about the results of using the Mwabu interactive tablet.					
I believe I could communicate to others the consequences of using the Mwabu interactive tablet.					
The results of using the Mwabu interactive tablet are apparent to me.					
I would have difficulty explaining why using the Mwabu interactive tablet may or may not be beneficiary					

THE END

Thank you for taking the time to answer this questionnaire

Appendix D: Information and Consent Form for Pupils

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THE UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

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I am a post-graduate student at the University of Zambia, School of education department of library and information science. I am researching **"on *the usefulness of interactive tablets in facilitating teaching and learning activities: a case study of Mwabu Interactive Tablets"***. The purpose of this study is to explore how the Mwabu interactive tablets are utilized by teachers and pupils, to determine the teaching and learning materials integrated with the Mwabu interactive tablet, and to determine the perceived usefulness of teaching and learning materials integrated with the Mwabu table You have been randomly selected to voluntarily take part in this study as one of the teachers.

Purpose of the Research

The usefulness of interactive tablets in facilitating teaching and learning activities: A case study of Mwabu Interactive Tablets

Type of Research Intervention

The research involves answering questionnaires that will be administered to you.

Participant selection

You are being invited to take part in this research because you are using the Mwabu interactive tablet and there is a need to determine the usefulness of interactive tablets in facilitating teaching and learning activities: a case study of Mwabu interactive tablets.

Voluntary Participation

Your decision to participate in this study is entirely voluntary. It is your choice whether you want to take part or not. If you choose not to consent, nothing will change. You may also choose to change your mind later and stop participating, even if you had earlier agreed, and still nothing will change.

Procedures

You are invited to participate in a research study by answering a questionnaire. You have been randomly selected and if you do not wish to answer any questions you may skip them and move to the next question. The information recorded is confidential, your name is not being included on the forms, only a number will identify you, and no one else except the Principal Investigator will have access to the survey.

Risk and discomfort

You do not have to answer any question or take part in the study if you feel the question(s) are too personal.

Reimbursements

You will not be provided any incentive to take part in the research. There may not be any benefit for you directly now but allowing your participation will help find the answer to the research question.

Confidentiality

The information that will be collected from this research project will be kept confidential. The information that will be collected from the research will be put away and no-one but the Principal Investigator will be able to see it. All information on your questionnaire will have a number on it instead of a name.

Sharing of Results

The knowledge that will be obtained from this study will be shared with you through the iSchool Company. Confidential information will not be shared.

Right to Refuse or Withdraw

You do not have to agree to take part in this research if you do not wish to do so and refusing to will not affect you. You may stop participating in the research at any time that you wish.

Who to Contact

If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, please contact me on: Kadeyo Mutale Kuyela, Lusaka. Cell-0971946568. E-mail: kadeyo94@gmail.com. This proposal or protocol has been reviewed and approved by HSSREC which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find about more about the IRB, contact:

The Chairperson,
Dr. Jason Mwanza,
Humanities and Social Sciences, Research Ethics Committee,
University of Zambia
P O Box 32379
LUSAKA

      OR

The Director
Professor. Henry M. Sichingabula
Directorate of Research and Graduate Studies
University of Zambia
P O Box 32379
LUSAKA

Section B: Certificate of Consent

I have been invited to participate in this research **"on *the usefulness of interactive tablets in facilitating teaching and learning activities".*** A case study of Mwabu Interactive Tablets. I have read the foregoing information, or it has been read to me and I have understood it. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I will receive no payment for participating in the study. I know that my participation is anonymous and I have access to the data and records at any time. I know that I can stop my participation in this study at any time. I consent voluntarily to answer the questionnaire.

Print Name of Participant: _____

Signature of Participant: _____

Date_____

Statement by Researcher/Person taking consent

I have accurately read out the information sheet to the potential participant and the best of my ability made sure that the participant understands that the following will be done

1. Questionnaires will be administered to them

2. Their answered questionnaires will be kept as confidential documents

I confirm that the participant was allowed to ask questions about the study and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent and the consent has been given freely and voluntarily.
A copy of the ICF has been given to the participant.

Print Name of the Researcher/ person taking the consent: _____

Signature of Researcher/person taking the consent: _____

Date: _____

Contacts for Questions
Principal Investigator
Names: Kadeyo Mutale Kuyela
Phone: 0971946568/0968411711
Email: kadeyo94@gmail.com

Appendix E: Questionnaire for Pupils

The University of Zambia

School of Education

Department of Library and Information Science

Questionnaire

Research Title:

The usefulness of Mwabu Interactive Tablets in facilitating teaching and learning activities: A Case Study of Mwabu Interactive Tablets.

Dear Respondent,

I am a Master's of Library and Information Science student at the University of Zambia, Great East Road researching the title above purely for academic purposes. Be assured that the information you will provide in this Questionnaire will be treated with the utmost confidentiality. Your participation will be highly appreciated.

Instructions:

1. Kindly answer all questions
2. Do not write your name or identity information on the Questionnaire.

Section A: Background Information

1. What is your gender?

   a) Male   ( )
   b) Female   ( )

2. What grade are you?

   a) Grade 5   ( )
   b) Grade 6   ( )
   c) Grade 7   ( )

3. How old are you…………………………………………………………………?

Section B: Utilisation of the Mwabu Interactive Tablets by Pupils

4. Do you own Mwabu interactive tablet or you have access to the ones for the school?

    a) Yes   ( )

    b) No   ( )

5. Do you agree that Mwabu interactive tablets easy to use?

    a) Strongly Agree   ( )

    b) Agree   ( )

    c) Undecided   ( )

    d) Disagree   ( )

    e) Strongly Disagree   ( )

6. How often do you use Mwabu interactive tablet for school-related activities?

    a) Every lesson   ( )

    b) Often, but not every lesson   ( )

    c) Sometimes in some lessons   ( )

    d) Never   ( )

7. To what extent do you use Mwabu interactive tablet for school-related activities?

N0	Variables	Never	Not Often	Often	Very Often
1	For reading and listening to stories				
2	For playing games				
3	For calculations				
4	For spellings				
5	For tests and quizzes				
6	Note-taking				
7	For homework				

8. Do you agree that the use of the Mwabu interactive tablets is useful in facilitating teaching and learning activities?

a) Strongly Agree   ( )

b) Agree   ( )

c) Undecided   ( )

d) Disagree   ( )

e) Strongly Disagree   ( )

THE END

Thank you for taking the time to answer this questionnaire

Appendix F: Observation methods for both Parents and Pupils

The University of Zambia

School of Education

Department of Library and Information Science

Questionnaire

Research Title:

The usefulness of Mwabu Interactive Tablets in facilitating teaching and learning activities: A Case Study of Mwabu Interactive Tablets.

1) What are the application softwares' that have been integrated in the Mwabu interactive tablet in line the Zambian curriculum?
2) How do the application softwares' that have been integrated in the Mwabu interactive tablet help teachers and pupils in learning activities?