

**Strategies for Contextual Teaching and Learning of Science in Selected Primary  
Schools in Mzimba-North**

**By**

**Jean Nyirenda  
(MEDTE2520)**

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for the degree of Master of Education in Teacher Education**

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## **Declaration**

I, Jean Nyirenda declare that the work contained in, including the organization and writing of this thesis is entirely my own and has been carried out at Mzuzu university under the supervision of Dr. Margaret Malizgani Mdolo. It is also specifically being submitted for the purpose of my degree of Master of Education (Teacher Education) of Mzuzu University and it is not concurrently being submitted for any other degree. All reference material contained in here has been dully acknowledged by means of complete references.

Signed \_\_\_\_\_

(Student)

Date \_\_\_\_\_

Signed \_\_\_\_\_

(Supervisor)

Date \_\_\_\_\_

## **Acknowledgements**

I would like to express my appreciation to my supervisor Dr Margaret Malizgani Mdolo for her tireless effort in shaping this study to be what it is today. Her continuous guidance with a warm attitude and love was so significant to this study. I am very grateful to my loving and ever supportive husband Daniel Nyirenda for the great financial and emotional support for me to complete this study. I would like to also thank my dear brother Kondwani Nyirenda for the financial support and encouragement during this study. I give special thanks to the 12 primary school science teachers and 30 primary school learners for their participation in the study.

## **Dedication**

I wish to dedicate this study to my father REV. DR PK NYIRENDA (late). He encouraged me to apply after I gave up due to the countless times of being turned down. He assured me that, that particular application submitted by him would be successful and it was. He encouraged me to work hard and make him proud. Soon as he went to be with the Lord, I was successful. Continue resting in peace Dad.

## **Abstract**

Contextual teaching and learning (CTL) is a process that helps students learn and understand concepts within real-life contexts. Despite the implementation of the PCAR curriculum aimed at enhancing the relevance of education in Malawi, significant challenges persist in achieving the desired societal outcomes. The effectiveness of science education, particularly in contextualizing teaching methods, is crucial in addressing these issues. This study investigated the strategies that primary school teachers use to teach science contextually. The objectives of the study were to establish science teachers' and learners' knowledge of contextual teaching and learning of science in selected primary schools, to assess strategies used in contextual teaching and learning of science in selected primary schools, and to identify challenges faced by science teachers in contextual teaching and learning of science in the selected primary schools.

The study was conducted in selected primary schools in Mzimba North District. It was underpinned by the constructivist paradigm, and a qualitative approach was used. In this study, the researcher used the situated cognition theory by Jean Lave and Wenger as a framework. Twelve primary school teachers and five primary school pupils from selected schools were chosen to be part of the sample. This sample size was guided by scope of the study, duration, analysis and expected outcomes. Teachers were chosen using purposive sampling and learners were chosen by stratified random sampling. The choice of the schools was done using systematic random sampling. Respondents were selected from six primary schools in the Northern Education Division under the Ministry of Education in Malawi. Data was collected through interviews, focus group discussions (FGD), classroom observation, and document analysis. Thematic data analysis was conducted.

The findings of the study show that primary school science teachers lack adequate knowledge of contextual teaching and learning due to several challenges, such as a lack of teaching and

learning resources, time constraints, large class sizes, poor planning, and a lack of training on CTL. However, learners were able to demonstrate knowledge of contextual learning, although their understanding was more focused on the definition of the term itself. The learners were able to explain how they apply the knowledge gained in school to their lives. The only challenge they faced was a lack of supervision and follow-up by their teachers. Despite 50% of the sampled teachers having the knowledge on CTL and the methods involved, there is lack of compatibility regarding the same in the classroom setting due to different challenges however, class observations also revealed that this is due to unwillingness. Most learners are aware and able to apply what they learn in class they only require support and encouragement. Several recommendations were made based on the results of the study. Some of the recommendations include the need for training for primary school teachers on CTL, supervision of the application of knowledge gained from the training by school authorities, intensive training or in-service education programs related to the improvisation of teaching and learning resources.

## **Acronyms and abbreviations**

<b>AIDS</b>	Acquired Immunodeficiency Syndrome
<b>CTL</b>	Contextual Teaching and Learning
<b>DEM</b>	District Education Manager
<b>FDG</b>	Focus group discussions
<b>HIV</b>	Human Immunodeficiency Virus
<b>MOE</b>	Ministry of Education
<b>MZUNIREC</b>	Mzuzu University Research Ethics Committee
<b>NED</b>	Northern Education Division
<b>NPC</b>	National Planning Commission
<b>OBE</b>	Outcome Based Education
<b>PBL</b>	Problem based learning
<b>PCAR</b>	Primary Curriculum and Assessment Reform

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# CHAPTER ONE: INTRODUCTION

## 1.0 Introduction

This chapter provides context for the study by discussing contextual teaching and learning, stating the problem, explaining the purpose and objectives, justifying the study, outlining the theoretical framework, defining the scope and limitations.

## 1.1 Background of the study

Contextual teaching and learning is a teaching and learning process that helps students learn and understand concepts using real-life contexts. The approach seeks to enable students to discover the concepts they have learned through knowledge and experience. Students are expected to apply the knowledge they have gained in their own contexts and in their everyday lives. There should be a connection between the concepts learned in class and real-life experiences (Selvianiresa & Prabawanto, 2017). Science learning in elementary schools is a curricular program that aims to develop the competence of students' attitudes, knowledge, and skills as a basis for and strengthening understanding of natural phenomena. Therefore, science learning in elementary schools should be closer to investigating the natural environment, solving problems, and developing skills and decision-making and application in everyday life (Fitriani et al., 2023).

In today's global education system, science education is expected to become more meaningful relevant and aspiring. However, in many countries the traditional decontextualised approaches to teaching and learning still persist in the society classrooms. As a result, many students interests and engagement in science appears to be waning around the world. In response to science teaching and learning-related problems, various approaches have been developed over the last two decades to make science more understandable, interesting and relevant to students.

Contextual teaching and learning approach is widely used in science worldwide but there is lack of measurement instruments to examine teachers self-perceived practices of this approach in science classrooms (Teshager et al., 2021).

Contextual teaching and learning (CTL) is an approach to education that emphasizes the connection between academic content and real-world contexts. In the context of science education in African primary schools, CTL can be particularly effective in engaging students and fostering deeper understanding of scientific concepts. Contextual teaching and learning emphasizes active engagement and hands-on experiences. Science education in African primary schools can benefit from practical activities, experiments, and field trips that allow students to directly observe, explore, and experiment with scientific concepts. For instance, students might conduct experiments related to local ecosystems, renewable energy sources, or traditional building materials (Ssentanda, 2017).

The nature of scientific knowledge is related to the values and assumptions that are deeply rooted in science, scientific knowledge, and the advancement of scientific knowledge. These values include self-reliant thought, tentativeness, creativity, evidence-based reasoning, verifiability, and cultural and social embeddedness (Lederman & Lederman, 2012). In light of this, science must be taught in a way that fosters critical thinking in learners, which can be achieved through the use of inquiry-based learning by engaging learners in experiments, small projects, and various activities. Additionally, teachers need to create a supportive learning environment by understanding students' pre-existing ideas about science concepts and supporting and encouraging students to progress in their scientific understanding (Fitzgerald & Smith, 2016).

Effective teaching and meaningful learning is of great importance, as the field of education needs to adapt and implement changes to address the increasing global challenges of the 21st

century. Education should emphasize the mastery of skills and positive attitudes in addition to the mastery of knowledge. Contextual teaching and learning is one of the best ways to achieve meaningful learning. It helps teachers establish connections between subject matter content and real-life situations. Contextual teaching and learning motivate learners to take ownership of their own learning and make connections between knowledge and its application in their own contexts (Haryanto & Arty, 2019).

Throughout the history of civilization development, scientific knowledge has been necessary in our everyday lives to meet human needs by finding solutions to identified problems (Suryawati & Osman, 2017). Contextual teaching and learning CTL brings teaching and learning to life through its focus on inquiry-based learning. Researchers consider CTL to be stimulating for students, as it helps them apply investigative skills, create meaning, and acquire scientific knowledge (Alake-Tuenter et al., 2012). In an attempt to enhance the quality of education in Malawi, the Ministry of Education, guided by the Malawi Institute of Education, initiated the Primary Curriculum and Assessment Reform (PCAR) in 2001, which was later implemented in 2007. Science and Technology is one of the nine areas of study in the national curriculum of 2007. This subject place emphasis on practical skills and facilitative pedagogies. Through PCAR, the Malawi government shifted the curriculum from a content-based approach to an outcomes-based education (Khomani, 2003).

However, the effective implementation of an education system that produces scientifically and technologically literate individuals relies on teachers' comprehension of suitable pedagogies in teaching science, which consequently impacts their classroom teaching practices and student learning outcomes. The PCAR curriculum under the OBE advocates for learner centered and participatory approach which includes field visits, group discussions, projects, panel discussions among others (Chirwa et al., 2014). These methods are the ones which are used in the CTL



teaching process. If teachers apply the CTL, then the goals of the PCAR curriculum will be achieved.

For contextual teaching and learning to be realized, primary school teachers in Malawi must employ appropriate instructional methods that foster student understanding and enhance their ability to apply acquired knowledge in daily life. Nevertheless, a study conducted by Chikasanda et al. (2013) revealed that primary school teachers in Malawi had disparities in their use of teaching and learning aids, as well as the utilization of inappropriate instructional approaches to promote student understanding. In order to achieve contextual teaching and learning, the engagement of community of practice members during curriculum implementation becomes crucial (Chikasanda et al., 2013).

The Primary Science curriculum sets forth specific success criteria that, if comprehended and learned by students, can equip them to become productive members of society. The syllabus for Primary Science includes topics such as scientific investigations, HIV and AIDS, methods of cooking, and food processing, among others. The primary goal of teaching Primary Science is to equip students with the necessary skills to be independent after completing primary school. The core elements of the curriculum that contribute to achieving this goal include basic scientific knowledge, skills, and attitudes; scientific investigation for application; knowledge for development; nutrition and health; and marketing and managing change. However, some students do not effectively demonstrate through practical application that they have learned these important topics upon completion of primary school. Limited research has been conducted on how teachers in primary schools are instructing students in order to foster contextual acquisition of skills and knowledge, as well as how they are assessed to determine their understanding and application of scientific knowledge within a contextual framework.

## **1.2 Statement of the Problem**

In the pursuit of improving the wellbeing of its citizens, Malawi has been reviewing the school curriculum to meet the needs of its society. The PCAR curriculum under OBE program, currently in use in Malawi which was implemented to make education relevant and responsive to the needs of Malawians (Manda, 2014). Primary schools, require teachers who are able to contextualise teaching and learning to enhance students' understanding and application in real life contexts. The curriculum includes content on common infectious diseases, indigenous and modern technology, use of energy, mixtures, and other topics. It is expected that this curriculum will help most Malawians live healthy, productive, economically stable, and self-reliant lives.

However, despite the majority of Malawians having attended primary education, their quality of life falls short of this expectation as it is characterised by food insecurity, disease outbreaks, poverty, environmental degradation, and other challenges. Up to 70% of the people in Malawi live below the poverty line. This makes it one of the poorest nations worldwide. The country's economy is mainly agriculturally based with up to 80% of its citizens relying on agriculture for their livelihoods (Altinyelken & Hoeksma, 2021). The Malawi 2063 (MW2063) Agenda contains our aspirations as a nation and what we want to be achieved by 2063. We want Malawi to be transformed into a wealthy and self-reliant, industrialised upper middle-income country by the year 2063. To achieve the national and continental aspirations, the MW2063 recognises human capital development as one of the enablers. Malawi however is still grappling with developing her human capacity. One of the challenges being poor access to quality education at the early childhood, primary, secondary and tertiary levels as well as skills mismatch (Mkochi, 2021).

The current socio-economic issues facing Malawians are intended to be addressed through the

application of primary science, among other subjects. If those who have completed primary education are still grappling with these social issues, one may question whether the teaching of science is being contextualised or not. This goes back to teachers because according to Rahmaniati and Samsudin (2023), the teacher's efforts in managing and empowering various learning variables are important to students' success in achieving the planned goals. Therefore, the selection of methods, strategies and approaches in designing learning models to achieve a meaningful active learning climate is a demand that teachers must meet. It is against this backdrop that this study aims to investigate how contextual teaching is implemented in selected primary schools.

### **1.3 Aim and Objectives of the study**

#### **1.3.1 Aim of the study**

The study aimed to investigate the strategies that primary school teachers are taking in implementing contextualised teaching and learning in selected primary schools in the northern education division in Malawi. It was guided by the following objectives:

#### **1.3.2 Specific objectives**

The specific objectives of this study were to:

1. Establish science teachers' and learners' knowledge of contextual teaching and learning of science in selected primary schools.
2. Assess strategies used in contextual teaching and learning of science in selected primary schools.
3. Identify challenges faced by science teachers in contextual teaching and learning of science in selected primary schools.

#### **1.4 Justification for the study**

The significance of this study lies in its potential to contribute to understanding how science is taught in the classroom. It aims to shed light on the challenges faced by the national curriculum and assessment framework initiative in its implementation. The findings of this study may benefit curriculum developers and the Ministry of Education by providing insights into the challenges faced by science teachers in using the contextual teaching and learning approach within the national curriculum and assessment reform initiative. Additionally, the study's findings may provide science teachers with baseline data that can help align their teaching with the requirements of the Ministry of Education.

The Malawi 2063 (2063) aims to transform Malawi into a wealthy and self-reliant industrialised upper middle-income country by the year 2063 (NPC, 2020). One of the areas that could contribute this, is meaningful education right from primary school. Contextual teaching and learning has principles that could make learners become innovative, self-reliant and productive people. In view of this, the study will help stake holders to have an insight on how the CTL process could contribute to the fulfilment of 2063 agenda if it could be adopted and embraced. This could make the Malawian citizens acquire initial skills that could be advancing with educational progression, that could help achieve developmental areas such as industrialisation and agricultural productivity.

#### **1.5 Theoretical Framework**

A theoretical framework is a logically developed and connected set of concepts and premises derived from one or more theories that a researcher creates to support a study (Varpio et al., 2020). Theories are formulated by researchers to explain phenomena, establish connections, and make predictions. In a theoretical framework, you explain the existing theories that support your research, demonstrating that your paper or dissertation topic is relevant and firmly grounded in

established ideas (Vinz, 2023).

A theoretical framework aids researchers in demonstrating and understanding of theories and concepts that are pertinent to their research topic, providing a lens through which to examine and expand upon existing knowledge. It establishes a connection between the researcher and the existing knowledge base, guided by the chosen theory. It is a logically developed and connected set of concepts and premises derived from one or more theories that a researcher establishes to structure a study. To create a theoretical framework, the researcher must define the concepts and theories that will serve as the foundation for their research, establish logical connections between them, and relate these concepts to the study being conducted (Varpio et al., 2020). In conclusion, a theory is essential to any research study as it provides direction, guidance, and a means of validating or refuting a phenomenon. Therefore, in this study, the situated cognition theory by Jean Lave and Wenger will serve as the guiding framework.

Lave and Wenger argue that learning is an integral part of generative social practice within the everyday world. They propose that learning is a social process whereby knowledge is constructed. According to their theory, learning occurs within a specific context and is embedded within a particular social and physical environment. The theory consists of two main ideas: (1) learning is unintentional, and (2) learning is situated within an authentic activity, context, and culture. This theory is based on a sociocultural perspective that views knowledge as defined and agreed upon by a society or community. They assert that learning should take place within a community of practice (Wenger, 2011). Learning through communities of practice involves learners following actual practitioners around to observe their practice and learn through guided practice. This is where members engage in joint activities and discussions, assist each other, and exchange information. They build relationships that enable them to learn from each other (Wenger, 2011). They further argue

that learning should take place through an apprenticeship model. This is a particular way of enabling students to learn by doing. It is often associated with vocational training, where a more experienced tradesman models behaviour. The apprentice attempts to follow the model, and the tradesman or journeyman provides feedback. The apprentice observes the master and assistants over and over again, modelling the target process, which usually involves a number of different but interrelated subskills. Eventually, the apprentice attempts to execute the process with help from the master and gains the necessary skills (Jenlink & Austin, 2013).

Skills are of great help in the accomplishment of real-world tasks, and learning is embedded in a social functional context different from the school environment, where knowledge is abstract from its use in the real world. Apprentices learn domain-specific methods through closely observing, training, and practical experience (Cohen et al., 2018).

The study that the researcher undertook aimed to investigate the strategies that primary school teachers use in delivering contextual lessons. Contextual teaching and learning demand that learners should connect new concepts to the real world through their own experiences or experiences that teachers can provide for them. The study concentrated on how teachers are teaching in order to achieve contextual teaching and learning, which leads to meaningful learning. The situated cognition theory that the researcher chose highlights the best ways for learners to achieve this meaningful learning through communities of practice, apprenticeship, and learning in an authentic activity context and culture. The researcher used the theory as a guide in collecting relevant data, methodology, and also in discussing the findings.

## **1.6 Scope of the study and delimitation**

The study concentrated on how science teachers are teaching contextually in order to foster application of knowledge by pupils in their society. A more comprehensive study would need to include all subjects and also those who went through primary education and are in the

communities in order to find out how they apply what they learned in school to their everyday lives. Due to time restrictions, this was not possible. Therefore, the findings of this study cannot be generalized to all subjects in the curriculum. The respondents in this study were science primary school teachers and science pupils only.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

Literature review helps researchers to discover what has already been written in the field of study and greatly guides the research under study (Randolph, 2019). Although there is a vast amount of literature available on contextual teaching and learning globally, this chapter provides a literature review that has a significant relationship with this study. It mainly focuses on the description of contextual teaching and learning, the benefits of contextual teaching and learning to learners, the knowledge of teachers and learners on contextual teaching and learning, and the strategies used by teachers in the contextual teaching and learning of science. Additionally, it addresses the challenges faced by science teachers in implementing the contextual teaching and learning approach.

### **2.1 Contextual teaching and learning**

The Contextual Teaching and Learning (CTL) approach is a method that engages students actively in the learning process to discover concepts through their knowledge and experiences (Afifah et al., 2023). Its goal is to help students find meaning in academic subjects by connecting them to their daily lives and personal, social, and cultural circumstances. This helps teachers relate the material being taught to real life. or the experience of students and encourage students to apply it in their lives both as members of the family and society (Budiman, 2021). Contextual Teaching and Learning as a learning approach concentrates on sharing meaningful and actual experiences with students through activities connecting learning activities in the classroom to the outside environment around the classroom (Putri et al., 2020).

In CTL, learners are encouraged to be active participants, applying their experiences to create



new things and fostering their creativity. Contextual learning stimulates the brain to form meaningful patterns. Contextual teaching and learning CTL presents lesson material by exposing students to problems that require solving in order to achieve educational goals relevant to everyday life (Fitriani et al., 2023). Furthermore, CTL helps teachers relate subject matter to real-world situations, connecting students' knowledge to solve everyday problems in their families, communities, or workplaces. Learning process that facilitates teaching materials and activities that are close to the real world; develops critical thinking, problem-solving, and creativity in student learning materials/activities; connects knowledge with various applications in the daily life of students; and facilitates learning by doing (Fitriani et al., 2023).

This learner-centred instructional strategy facilitates understanding by teaching within familiar contexts. It utilizes events from students' social and cultural backgrounds as platforms for learning concepts. The CTL model aims to help students see meaning in academic material by linking academic subjects to the contexts of their daily lives such as their personal, social, and cultural experiences. Contextual learning is a system that stimulates the brain to form patterns with meaning, which is applicable to students' everyday lives. It goes beyond theoretical knowledge, inviting students to learn in practical terms (Dewi & Primayana, 2019). Additionally, CTL is a constructivist approach that focuses on contextually relevant knowledge for students from diverse backgrounds. This learning system connects academic content to real-life contexts, ensuring storage of not only short-term memory but also long-term memory for future application in students' professional lives (Samsudin, Raharjo, et al., 2023). Contextual teaching and learning CTL is referred to as a contextual approach because it helps teachers connect academic content to real-world situations that students typically encounter, inspiring them to make connections between their knowledge and their lives.

The Contextual Teaching and Learning (CTL) model is a holistic learning process that aims to help students understand the meaning of learning materials while connecting their knowledge to the context of their daily lives, including personal experiences, social problems, and cultural contexts. This model allows students to develop dynamic and flexible knowledge or skills based on their own understanding (Al Hakim et al., 2018; Davtyan, 2014; Dewi & Primayana, 2019; Haryanto & Arty, 2019; Omoroghomwan, 2017; Samsudin, Raharjo, et al., 2023; Selvianiresa & Prabawanto, 2017). This aligns with Piaget's notion that learning makes learners active by encouraging them to create and explore new things based on their experiences, fostering their creativity (Selvianiresa & Prabawanto, 2017).

## **2.2 Benefits of contextual teaching and learning to the learners**

Contextual teaching and learning is considered suitable to primary students because it allows the teacher to provide contextual examples of subject matter which supports students' thinking ability and provides an inquiry learning environment that involves students as an active learner even though the learning is held through online (Ilyas & Liu, 2020). The implementation of CTL learning model with various learning activities could promote a fun learning atmosphere to primary students that lead to the discovery of concept by their own little by little and the results can be expanded through context (Kristidhika et al., 2020). This statement is supported by the result of another research conducted by Yesya and Desyandri (2019) which shows that the implementation of CTL could help the primary students to associate the learning material with the real-life situation thus the students could build their conceptual understanding easier and promote optimal learning. The CTL approach is superior especially when practiced in elementary school because it is very competent in providing efforts towards academic expertise by linking the theories studied with the real circumstances encountered by students, this will make it easier for students to remember material and long stored in the brain (Okayanti & Putra, 2020).

According to Haryanto and Arty (2019), contextual teaching and learning (CTL) is a learning approach that can be applied to improve high-level thinking skills and self-efficacy of students. Learning is done by connecting the material with real-life contexts, allowing students to analyse, evaluate, and create. The results of the study indicated that CTL is a concept that helps teachers relate subject matter to real-world situations. Additionally, CTL motivates learners to take charge of their own learning and make connections between knowledge and its application in various contexts of their lives, such as family, citizenship, and work. It is a holistic learning process that aims to help students understand meaningful learning that is linked to real-life contexts, such as personal, religious, social, economic, and cultural environments. Ultimately, students gain knowledge and skills that can be applied and transferred from one problem context to another. CTL-based learning provides opportunity and helps the students to gain an understanding of scientific methods in order to develop critical thinking skills, self-regulation, and understanding of specific topics (Zaifaro et al., 2018).

Dewi and Primayana (2019) highlight in their study that CTL helps students develop critical thinking skills and participatory skills in their daily lives. It also guides teachers in connecting the material with real-world situations and encourages students to make connections between their knowledge and its application in their everyday lives as family members and members of society. According to Selvianiresa and Prabawanto (2017), CTL can improve students' ability to connect mathematical concepts. The CTL approach provides students with knowledge and experiences that help them learn independently and develop mathematical competence. This may give learners the idea that mathematics can be applied and beneficial to their lives. In the context of learning science in elementary schools, several previous studies have examined the implementation of the CTL model for learning in elementary schools. Several studies have concluded that applying the CTL learning model to science subjects can improve student

learning outcomes (Rahmaniati & Samsudin, 2023). Contextual teaching and learning is a learning system that goes beyond merely guiding learners in the learning process. By using CTL, the learning process includes searching for meaning through the individual's context. The process of searching for meaning makes the learning process come alive (Al Hakim et al., 2018). A lively learning process attracts learners to actively engage in learning. This is the unique aspect of CTL in the learning process. In addition to its benefits, the use of CTL, problem-based learning (PBL), and the expository learning model produces different levels of learning creativity and mastery of scientific learning outcomes. The highest levels of creativity and science learning outcomes were achieved by students using the CTL learning model, followed by PBL learning, while the lowest levels were observed with the expository learning model. This demonstrates that CTL fosters creativity and mastery of scientific learning outcomes in learners (Samsudin, Raharjo, et al., 2023).

### **2.3 Knowledge of teachers on contextual teaching and learning**

A study was conducted by Muhammad Zulkifli (2021) on teachers' perception of using Contextual Teaching and Learning (CTL) in teaching English at SMA NERI 22 Makassar. The study's findings revealed both positive and negative perceptions. Among the positive perceptions, it was noted that the classroom environment in CTL serves not only as a source of information but also as a platform for students to apply the knowledge they have acquired from real-life situations. One teacher stated, "It is easier for students to comprehend the learning material when it is contextualised." Contextual teaching and learning is beneficial for teachers in terms of facilitating the teaching process and utilizing teaching and learning materials. Another teacher pointed out that "Students grasp the presented material more easily because one of the strengths of the CTL method is its direct relevance to everyday life problems." According to another teacher, "The CTL method provides contextualised material, making it easier for students to comprehend the content and generating their interest and

curiosity in the subject matter” (Zulkifli, 2021).

On the other hand, one teacher expressed concerns that CTL may limit the development of students’ in-depth understanding of the subject matter. Additionally, there was an observation that the method occasionally hinders students from understanding the specific contextual aspects during lessons and contributes to their reluctance to seek clarification. This study shares similarities with the researcher’s proposed study in terms of adopting a qualitative approach. However, it focuses on English teachers, whereas this study targeted science teachers. Nonetheless, the approach remains the same and the results can be applied universally in teaching any subject. It would have been advantageous if the researcher had also incorporated lesson observation to connect teachers’ responses with the actual classroom practices.

A study was conducted by Harun et al. (2015) with the aim of rationalising the limitations of passive students using CTL. It was discovered that teachers who understand the concept of CTL and are able to implement a contextual approach in their daily teaching and learning sessions effectively stimulate passive students to overcome their limitations. When planning and teaching using this approach, teachers must be aware of the characteristics and limitations of passive students, and should build instrumental, relational, and logical studies of the methods to be used. The results of the data analysis showed that moderate teacher understanding in the implementation of contextual teaching and learning sessions helps passive students overcome their limitations. The results indicated that the understanding of implementation of this contextual teaching and learning method to overcome the limitations of passive students was moderate.

The design of this study was a case study, which is suitable for understanding complex issues and allows for flexibility in data collection through various means. Furthermore, it has the ability to

capture the context and lived reality of the participants. Simultaneous strategies for collecting data in a mixed method were applied, which was a good strategy for enriching the data. All teachers were included in the study; however, only 5 were selected for interviews to collect qualitative data. This selection may have limited the information provided.

#### **2.4 Strategies used in contextual teaching and learning**

The success of learning will be evident in the changes observed in students as well as in the efforts of educators to deliver the material. Teachers or educators are also required to be actively involved in the teaching and learning process, enabling students to easily understand, communicate, and solve problems in their daily lives. In order to effectively implement contextual teaching and learning, Haryanto and Arty (2019) explain that teachers must incorporate the following components of learning: constructivism, questioning, inquiry-based learning, learning community modelling, reflection, and authentic assessment. This is also supported by Johnson (2014), who states that CTL is a learning model that helps students find meaning in academic material by connecting subjects with their daily lives and personal, social, and cultural contexts. To achieve this goal, there are eight components that include making meaningful connections, engaging in meaningful work, practicing self-regulated learning, promoting collaboration, fostering critical and creative thinking, facilitating individual growth and development, striving for high standards, and utilizing authentic assessments (Johnson, 2014). Teachers must possess this knowledge in order to successfully implement contextual teaching and learning.

Aliyyah et al. (2020) came up with six critical elements of CTL Meaningful learning: understanding, relevance and personal appreciation of students that they have an interest in the material that must be studied. Education is considered relevant to their lives. Application of knowledge: the ability to observe what is learned is applied in other settings and functions at

present and the future. Higher-level thinking: students are trained to use critical thinking creative in collecting data, understanding phenomena or solving a problem. Curriculum developed based on standards: teaching content relates to a range and variety of local, state, national, association and industry standards. Responsive to culture: teachers must understand and respect values, beliefs and the habits of students, fellow teachers and the communities in which they carry out teaching and learning activities. Different types of individuals and cultural groups influence learning. Authentic assessment: the use of different kinds of valid learning strategies reflects the actual learning outcomes expected of students. These strategies can include assessments or student projects and activities, use of portfolios, rubrics, checklists and observation guides as well as allowing students actively participate in assessing their learning and using them to improve their writing skills (Aliyyah et al., 2020).

Glynn and Winter (2004) conducted research on contextual teaching and learning and explained that CTL integrates inquiry-based learning, problem and project-based learning, and authentic assessment. This is in agreement with the findings of the study conducted by Haryanto and Arty (2019). Kurniasari et al. (2018) implemented a CTL learning model that combined various components, including constructivism, questioning, experiencing, inquiry, learning community, modelling, self-learning, critical and creative thinking, reflection, and authentic assessment.

Similarly, Dewi and Primayana (2019) mentioned seven strategies used in the CTL approach, including constructivism, questioning, inquiry-based learning, community, modelling, reflection, and authentic assessment. Dewi further emphasizes that learning strategies must shift towards contextual learning, where students actively construct their own knowledge, think critically, and have independence in learning. Selvianiresa and Prabawanto (2017) also identified the same seven components that teachers are encouraged to use as strategies for teaching contextually, namely constructivism, questioning, inquiry-based learning, learning

community, modelling, reflection, and authentic assessment. This particular study utilized quasi-experimental research.

Inquiry-based learning is an educational strategy in which students follow methods and practices similar to those of professional scientists in order to construct knowledge (Kelman, 2003). To build an inquiry-based classroom environment, the teacher must create a community of practice similar to that of scientists. In authentic inquiry-based activities, students take action as scientists do, experiencing the process of knowing and justifying knowledge (Abdi, 2014). Glynn and Winter (2004) conducted case studies on 21 teachers who used CTL to teach science in elementary schools to diverse groups of children. The results indicated that the conditions that fostered the implementation of CTL strategies were collaborative interaction with the students, a high level of activity in the lesson, a connection to real-world contexts, and an integration of science content with other content and skill areas. Furthermore, the CTL strategies were best implemented when teachers used them in conjunction with sound classroom techniques.

According to Sri Jumini (2019), in contextual teaching and learning, a teacher should create an environment where contextual learning is a controlling tool in the implementation of learning. The main things that should be done are: inviting students to work and find new knowledge, finding out about the topic being taught, developing students' knowledge through questions, creating small groups for discussions, question and answer sessions, using models and illustrations, and reflecting on each activity and objective assessment. In applying contextual teaching and learning, the teacher designs and guides all learning.

According to Suryawati and Osman (2017) an analysis of the literature has shown that science learning is most effective when students are exposed to inquiry learning methods because in such a learning environment, there is enthusiasm and a pleasant atmosphere. Students will



learn from what they did and from their experiences. Science teaching and learning should incorporate a wide range of methods and approaches that provide opportunities for students to explore through relevant activities, enabling them to build conceptual understanding in a meaningful way. Strictly speaking, inquiry learning allows students to develop skills and habits that indirectly teach them how to learn something, training them to always strive to develop reasoning and creativity for self-development as a whole (Suryawati & Osman, 2017).

One student-centred approach that has these characteristics is contextual learning. In contextual teaching and learning, students are given the opportunity to construct relationships in a context that is more relevant and meaningful to them. Therefore, it is not surprising that contextual learning is often hypothesized as an effective teaching method in improving students' potential and making them more interested in science learning. In its implementation, emphasis should be given to the cognitive, affective, and psychomotor elements, and strengthened with authentic assessment. At the same time, students are also educated towards the overall development of their character (Suryawati & Osman, 2017).

Wahyuningtyas and Wuryadi (2018) conducted experimental research and explained that learning through the CTL approach in the experimental class employed seven CTL standards in each session: constructivism, questioning, modelling, learning community, inquiry, authentic assessment, and reflection. At the beginning of learning, the students constructed their experiences related to the lessons to be discussed by implementing the CTL principles of constructivism and questioning.

By linking materials to activities that students normally engage in, they will be encouraged and motivated to think more deeply. The next principle of CTL is the learning community. Students are required to explore what is constructed through the learning community. In this case, students expressed their ideas related to the upcoming practicum in groups. Through such

activities, students are required to think critically and be more diligent in solving problems in the practicum activities.

The next principle of CTL concerns inquiry, which is the process of identifying a concept. This principle was fulfilled through a student worksheet workshop in the form of experiments with chicken bones. Students were guided in the practicum to identify the bones, the bone structure, and the bone function. This caused the students to think in greater depth, constructing their experiences with regard to the experiments that would be carried out, and learning from their peers about the concept under study.

The next principle of CTL is authentic assessment, namely an assessment of what students do. In developing their report, students work together, exchanging ideas and daring to express their opinions. They unify the various opinions and find the right concept using their ability to think critically. Developing the report will provide considerable feedback on opinions and ideas. The students should be able to reach a consensus, sorting out their ideas and equating opinions so that the report can be properly arranged. This process requires critical thinking.

Davtyan (2014) highlighted a very important strategy that teachers ought to follow while using CTL. He stated that teachers using this strategy must connect new perceptions with something familiar to students. "This helps students to link their knowledge with new information. In this stage, the curriculum must try to help learning in the context of life experience. It will encourage students to relate daily events that they see with the lessons that they learn. This will make it possible for students to find a solution to the problem.

Al Hakim et al. (2018) explained one of the strategies that educators can apply to achieve CTL. This strategy is referring to the process of meaning-seeking in CTL, where the teacher has a role as a facilitator who helps students discover their own knowledge. The desire to find meaning is

very basic in human life. For that reason, the main task of educators is to empower the students' potential, such as developing their ability to think critically. Thus, students become more skilled in extracting the meaning of the learning material that has been taught in the classroom.

## **2.5 Challenges that teachers face in the implementation of contextual teaching and learning**

Situmorang (2019) conducted a qualitative descriptive study on the implementation and challenges of contextual teaching and learning in private middle schools. The research focused on the behavioural aspects of the observed objects. The findings revealed several challenges in implementing contextual teaching and learning, including limited facilities for practical activities or experiments in the laboratory, lack of opportunities for teachers to develop contextually-based media, and inadequate teacher support in terms of learning society, constructivism, and finding. The behavioural approach utilized in this study allowed the researchers to obtain authentic data by experiencing and observing the actual happenings in the intended setting. Relying solely on questionnaires and interviews may result in invalid and insufficient data.

From the study done by Kresnadi et al. (2018) on 6th grade students of Pontianak selatan 14 state elementary school, the results showed that the assessment component was not implemented properly. Where the actual assessment of the CTL approach must include attitude, knowledge, and psychomotor assessments conducted periodically to review the development of student learning outcomes. However, due to time constraints, the number of students is quite large, and the teacher is in situations and conditions that do not know students in depth, then the actual assessment can only be done in the cognitive domain through assessment of student worksheets and summative tests. For all components of the CTL approach to be carried out properly, the teacher must know all of his students in depth both in

terms of psychology and ability to think (Kresnadi et al., 2018).

Harun et al. (2015) conducted a study to address the limitations of passive students through contextual teaching. The findings indicated that teachers' readiness to implement contextual teaching in their daily teaching and learning practices was at a moderate level. Time constraints, the need for adjustment in certain topics, and the average educational level of teachers were identified as reasons for this moderate readiness. Additionally, some teachers lacked exposure to the appropriate pedagogical skills required for contextual teaching and learning. It was also noted that some teachers had non-educational diplomas.

Dewi and Primayana (2019) discussed the challenges faced by teachers when switching from a direct method of teaching to a more contextual approach. Students who are accustomed to lecture-based teaching often lack independence in problem-solving and struggle with conducting real experiments on their own. This could lead to practical activities becoming time-consuming and affect the planning and implementation of learning activities, as well as the observation of student performance. Dewi and Primayana's study utilized a quasi-experimental approach, which may have limitations in terms of randomization. However, the results were still considered reliable and valid, as the researcher was able to generalise using the control group.

## **2.6 Chapter summary**

This chapter looked at the review of literature that was related to the researcher's study. the chapter presents discussions of what other researchers found out and published mainly in the area or field of contextual teaching and learning. The discussions created a backbone of the study. the researcher reviewed literature following the specific objectives of the study. the main focus of the literature review was the definition and explanation of contextual teaching and learning, benefits of contextual teaching and learning, knowledge of teachers on contextual

teaching and learning, strategies used in contextual teaching and learning and challenges that teachers face in contextual teaching and learning.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.0 Introduction**

This chapter presents a detailed description of the research methodology that was chosen for the study. It highlights the research paradigm, research approach, research design, settings, sample and sampling techniques, data collection methods and instruments, trustworthiness, procedures for data collection, ethics, type of data, and plan for data analysis techniques.

### **3.1 Research Paradigm, approach and design**

#### **3.1.1 Research Paradigm**

This study adopted a constructivist paradigm, a philosophical assumption that asserts that individuals construct their own knowledge of the world through experiencing things and reflecting on those experiences. It is based on the metaphor that individuals form or construct much of what they learn through experience (Cashman et al., 2008). According to constructivists, learning can only be deemed to have occurred if there is the construction of meaning. Thus, to the constructivist, constructing meaning is learning. This challenges the traditional concept of learning as a "chew, pour, and forget" process, where learning is driven by examinations with little or no motivation to apply the acquired knowledge in real-life settings (Adom et al., 2016).

The constructivist philosophy portrays the idea that learning does not solely occur through the traditional method of teachers standing in front of the class, but rather when the learner discovers knowledge through experimentation and active engagement (Adom et al., 2016). The researcher chose constructivism because this paradigm provides an understanding of how teaching should be conducted to facilitate meaningful learning. The paradigm assisted the researcher during class observations to examine how teaching practices that emphasise real world relevance and

application contribute to deeper understanding and engagement among learners. For instance, Amineh and Asl (2015) state that constructivist learning is a process of constructing meaning; it is how individuals make sense of their experiences. The authors further explain that teachers should consider their students' existing knowledge and allow them to apply that knowledge in practice.

The paradigm advocates for student centered approaches where learners take active role in constructing their knowledge. This guided the researcher in investigating how teaching strategies such as inquiry-based learning, problem solving and collaborative activities promote deeper learning and understanding. This constructivist perspective aligns with the concept of Contextual Teaching and Learning (CTL), which requires that learning should enable students to find meaning in the academic material they study by connecting academic subjects with everyday life contexts (Samsudin, Raharjo, et al., 2023). These two concepts share the common idea of applying acquired knowledge in practice. Therefore, it guided and assisted the researcher to gain insights into the dynamic interplay between contexts, teaching practices and students learning outcomes. No intervention or manipulation of the natural environment was made to ensure an accurate representation of the delivery and learning of contextual lessons.

### **3.1.2 Research approach**

This study adopted a qualitative approach. Qualitative research is exploratory in nature, and researchers use inductive reasoning. This type of research involves collecting data to refine research questions and build theory, rather than to test hypotheses. As the study progresses, patterns and themes are identified, leading to a comprehensive understanding of the phenomenon (Hays & Singh, 2011). Qualitative research explores and provides deeper insights into real-world problems by gathering participants' experiences, perceptions, and behaviour (Tenny et al., 2022). In this study, with reference to Tenny et al. (2022) and (Hays

and Singh (2011), the researcher sought to gain deeper insights from a real classroom setting and collect information on participants' experiences, perceptions, and behaviour related to contextual teaching and learning. The researcher observed the lessons of participants in their natural setting, where actual teaching and learning were taking place, in order to obtain the necessary information.

### **3.1.3 Research design**

This study utilized a multiple case study design. Case studies are a common research approach employed in various fields, particularly in evaluation, where the investigator conducts a comprehensive analysis of a case, such as a program, event, activity, process, or one or more individuals (Creswell & Creswell, 2023). This design enables a deeper understanding of the cases as a whole by comparing the similarities and differences among the individual cases within the sample. Findings derived from multiple case studies tend to be more robust and reliable compared to single case study research (Heale & Twycross, 2018).

The researcher opted for a multiple case study design to obtain a thorough analysis of how teaching is contextualised and to acquire more dependable evidence. A total of 12 teachers were interviewed individually to assess the extent of their knowledge regarding CTL. These interviews were complemented by direct observations of the same teachers during actual lessons, allowing the researcher to ascertain whether they were putting their knowledge into practice. This approach helped to gather evidence on the relationship between knowledge and practice of CTL. Additionally, the researcher conducted focus group discussions with 5 learners from the 6 schools visited. These interviews were aimed at obtaining insights from learners, particularly regarding what they learn, how they apply the acquired knowledge, and the practical benefits in their daily lives. This design enabled the researcher to identify similarities and differences among the three cases under investigation, making the collected



data more meaningful and facilitating data analysis.

### **3.2 Study site and participants**

The study was conducted within the Northern Education Division (NED) in the Northern Region of Malawi. It was conducted in six primary schools in the Mzimba North Education District. A target population is a selected group, usually large, from whom we seek to gather knowledge. However, studying this population directly is not feasible, so we employ sampling methods (Alvi, 2016; Punch & Oancea, 2014). The target population of this study consisted of primary school science teachers and senior primary school learners.

### **3.3 Sample size and sampling methods**

#### **3.3.1 Sample size**

In an investigation, it is sometimes impossible to assess every single member of a population hence a group of them is selected for assessment. This group is referred to as a sample.

##### **3.3.1.1 Main sample**

The main sample size for the study comprised 12 primary school teachers selected from six primary schools, resulting in two teachers per school. Additionally, 5 primary school learners were included from each school, making a total of 30 learners. These learners were chosen from Standards 7 and 8, which represent senior primary school classes. The decision to target senior classes was based on the assumption that these students would be better equipped to comprehend and engage with the focus group discussion questions. Furthermore, this approach was intended to streamline the translation and explanation process, thus saving time for both the participants and the researcher. It allowed the learners to allocate their time to other lessons on their timetable.

### **3.3.1.2 Pilot sample**

A pilot study was conducted before the main study to assess the appropriateness of the instruments used. A usual procedure for testing the quality of an interview protocol and for identifying potential researcher biases is the pilot study in which investigators try out their proposed methods to see if the planned procedures perform as envisioned by the researcher (Chenail, 2011). The pilot sample consisted of 3 teachers from 3 primary schools in Mzuzu city, with 3 learners from each school, resulting in a total of 9 learners. The findings of the study showed that 2 teachers possessed a comprehensive understanding of contextual teaching and learning, while only 1 teacher was able to effectively apply CTL strategies. During the focus group discussions, it became evident that the learners, who were from standard 5 and standard 6, encountered difficulties in comprehending the questions. As a result, the researcher decided to involve learners from higher grade levels in the main study. The pilot study aimed to assess if any modifications were necessary for the data collection instruments, but it was determined that the instruments were appropriate and only the level of classes for the sampled learners needed to be adjusted.

### **3.3.2 Sampling methods**

The process by which a sample is extracted from a population is called sampling. Systematic random sampling was used to select teachers. Purposive sampling technique was used to select teachers. This involves identifying and selecting individuals or groups of individuals who are proficient and knowledgeable about a specific phenomenon of interest (Cresswell & Plano Clark, 2011; Etikan et al., 2016). In purposive sampling, the sample is approached with a specific purpose in mind. In this study, the researcher was looking for teachers qualified to teach science in primary schools. One teacher was selected from standard 7 and another teacher was selected from standard 8. There was only one incident where one teacher was

teaching both classes, standard 7 and standard 8.

On the other hand, random sampling was used to select learners. Specifically, stratified random sampling was used to ensure gender balance. Stratified random sampling is a useful method for data collection when the population is heterogeneous. In this method, the entire heterogeneous population is divided into several homogeneous groups, known as strata. Each of these groups is homogeneous within itself, and then units are randomly sampled from each of these strata (Singh & Masuku, 2014). For this study, learners were divided into boys' and girls' groups. At each school, a group of boys and girls was chosen. Then, 2 girls were chosen from standard 7 and 3 boys were chosen from standard 8. In the next school, the researcher had 2 boys from standard 8 and 3 girls from standard 7. This alternation was done in all 6 schools so that the number of girls and boys in the learner sample would be the same.

### **3.4 Data Collection methods and instruments**

The data collection instruments that the researcher used in the study were interview guides, lesson observation forms, and a document analysis checklist. The researcher collected data through face-to-face interviews, classroom lesson observations, document analysis, and focus group discussions (FDGs). Multiple methods were employed in data collection to enhance the credibility of the findings and allow for various interpretations and meanings to be incorporated in the data analysis (Flick, 2014).

#### **3.4.1 Interviews**

Using interviews as a data collection method is beneficial because it allows researchers to have control over the line of questioning, thereby enabling them to collect relevant data (Creswell & Creswell, 2023). Interviews involve gathering data through direct verbal interaction between individuals (Opie, 2004). Cohen et al. (2018) explained that interviews are an important way

for researchers to check the accuracy, verify, or refute the impressions they gained through observation. Although interviews allow for probing and offer greater depth compared to other data collection methods, they are prone to subjectivity and bias on the part of the interviewer (Cohen et al., 2018).

Interviews were chosen because they cover a broader range of issues than would be possible through observation alone (Hobson & Townsend, 2014). An interview guide was developed to ensure consistency throughout the interview process. The design of the questions and the structure of the interview itself have a significant impact on the quality of the collected data (Saunders et al., 2023). The structure of the questions consists of three major parts: introduction, key questions related to the objectives, and clarifying questions for the respondents.

The study utilized semi-structured interviews because they allow for two-way communication and enable the interviewer to prepare questions in advance to guide the conversation and keep respondents on topic (Adams, 2015). Another advantage of semi-structured interviews is that they allow the interviewer to probe further on specific issues and obtain independent thoughts from each individual in the sample or group (Adams, 2015). However, it is important to note that semi-structured interviews are time-consuming, less structured, and require interviewer sophistication. They may also lack control if the respondent goes off track or fails to provide useful information.

To address these weaknesses, the researcher ensured that the interview guide questions were prepared beforehand and that responses were controlled and brought back to the intended focus if the respondent veered off track. This was achieved by ensuring that the researcher had a good understanding of the relevant substantive issues. This approach saved time and allowed for flexibility based on perceived prompts from the participants. The teachers were interviewed individually for approximately 20 minutes immediately after class observations. The data was

recorded through note-taking.

It is important to acknowledge that note-taking has the potential to introduce bias, as researchers may only record what they consider important. To address this, the interview guide (see Appendix IV) was used to prevent biased recording by helping the researcher to use the same set of questions for every interviewee because the questions in the guide are preplanned but the order is decided on the fly based on how the conversation goes. The list of questions helps the interviewer to be certain that all relevant queries are asked surrounding the topics that are essential and every interviewee answers the same question while elaborating their answers in different ways according to their knowledge and experiences (Naz et al., 2022). The interview guide ensures that the investigator covers all the terrain in the same order for each respondent (Krauss et al., 2009).

### **3.4.2 Observation**

The second data collection method used by the researcher was the observation method. This method was chosen because it allows for firsthand experience with participants. Etta (2018) (2018) defines observation as a way of gathering data by watching behaviour, events, or noting physical characteristics in their natural setting. Etta (2018) further states that observations can be overt, where everyone knows they are being observed, or covert, where no one knows they are being observed because the observer is concealed. Covert observations are likely to yield better results than overt observations, as people are more likely to behave naturally when they are unaware of being observed. However, the researcher chose to use overt observations, taking ethical issues into consideration.

One disadvantage of the observation method is that there may be private information that the researcher cannot report (Creswell & Creswell, 2023). This necessitates confidentiality on the part of the observer. During class observations, the researcher sat at the back of the class and

observed every activity in the lesson. In the course of the observation, the researcher recorded observation notes using an observation guide. Lesson observation forms were used to record data that was being observed. The observer watched and recorded the methods and strategies of teaching used, as well as the learners' response in terms of classroom participation on the lesson observation form (Appendix V).

One advantage of using an observation guide is that it helps the researcher collect data in a more organized fashion. By having a purpose or a particular aspect of the setting in mind that they wish to observe written down, researchers are better able to focus their attention on those activities that are likely to contribute to their data collection and therefore help answer their research questions. The guide also helps researchers know and follow what is happening by making notes at regular intervals (Kawulich, 2012). One disadvantage of an observation guide, however, is that it can be difficult to observe many things occurring simultaneously in the behaviour of the subject or the events occurring in the observed environment. All attention and energy are directed towards gaining information about the ongoing observed behaviour or events, making the task of simultaneous recording an additional burden. If one does not record the observed phenomena side by side, they may miss out on important details or connections later on, which could impact the process of proper observation (Satapathy, 2023). In relation to this, the researcher found it difficult to record some events or observations as guided by the observation guide because some observations were supposed to be done simultaneously. As a result, it was difficult to properly follow the guide without missing other important details. This challenge was overcome by engaging a data collection assistant. The researcher divided the items to be observed between themselves and the assistant, and later, after the observation process was over, the information was organized.

### **3.4.3 Document analysis**

Document analysis was chosen as the research method due to its convenience and non-intrusive nature. However, it is important to note that some documents may lack authenticity or accuracy (Creswell & Creswell, 2023). The specific documents analysed in this study included curriculum documents such as syllabi and teachers' guides. The researcher used a checklist to compare these documents with the actual classroom activities in order to determine if teachers were following the requirements outlined in the documents for teaching and learning purposes.

Documentary analysis is often favoured by qualitative researchers because it is a straightforward, efficient, cost-effective, and manageable method. One major advantage of this method is the easy accessibility of documents, often at little or no cost to the researcher. Since documentary data is used instead of data collected from human subjects, ethical approval is usually not required, allowing researchers to bypass the potentially complicated and time-consuming ethical approval process. However, it is important to acknowledge the limitations of document analysis. For instance, retrieving certain documents may not always be possible if access to them is deliberately blocked. Additionally, the geographical location of the documents may pose difficulties in terms of access, especially if they were not specifically produced for research purposes. Furthermore, some documents may lack sufficient details to be of use (Cardno, 2018). In this study, the researcher encountered a problem regarding the absence of the science and technology syllabi. However, this issue was resolved by borrowing the required document from a nearby school.

### **3.4.4 Focus Group Discussion**

Data from learners were collected through focus group discussions (FGDs). Focus group discussions are frequently used as a qualitative approach to gain an in-depth understanding of

social issues (Nyumba et al., 2018). FGDs were used by the researcher to gain an in-depth understanding of how learners apply what they learn in class to their real-life situations. The FGDs were conducted at each school, with 5 learners being interviewed at each school. Permission was sought from the headteachers and teachers to have these particular students participate in the FGDs. Each learner in the focus group introduced themselves, followed by an introduction of the researcher. The researcher provided an overview of the topic and stated the purpose of the group. Questions pertaining to the concepts learned in class and how they are applied in everyday lives were prepared in advance. One question was posed, and any learner was free to respond. When a learner began explaining, every other learner had to be quiet to give them a chance to speak. After that, anyone with other ideas could contribute and share their own experiences. The discussions were limited to 50 minutes due to time constraints, as the learners had to go back and attend to other subjects.

In terms of the advantages of focus groups, they can cover a large number of people in the same group (Wall, 2001) and efficiently gather a large amount of information (Barrows, 2000; Casey & Krueger, 1994; Gibbs, 1997), as well as capture specific opinions or attitudes (Hines, 2000) in a short time. Focus groups are also an effective tool when used in combination with other data collection methods as a form of triangulation (Threlfall, 1999). Above all, the major advantage of focus groups, which other research tools such as surveys cannot offer, is that they enable the researcher to gain in-depth insights into the researched topic (Masadeh, 2012). However, focus group discussions technique can have disadvantages, such as the risk of raising participants' expectations that cannot be fulfilled or the anticipation of "strategic" group biases (Harrison et al., 2015). In situations where participants are uneasy with each other or social stigmatisation due to disclosure may arise, participants may not freely discuss their feelings and opinions or hesitate to engage with the researcher's topic of interest (Harrison et al., 2015). Focus group discussions provide depth and insight but cannot produce useful numerical results; therefore,



they should not be used when statistical data are required (Nyumba et al., 2018).

One major challenge experienced during the focus group discussions was that some members seemed to dominate the conversations due to the presence of learners with extroverted personalities. Additionally, some learners had less speaking time in the discussions. To overcome this, the researcher made sure to give everyone a chance to talk by directly addressing the quiet learners and asking them to contribute. Every member was given the same amount of speaking time.

### **3.5 Data Analysis**

Qualitative data analysis includes, among other things, organising, describing, understanding, accounting for, and explaining data, as well as making sense of the data in terms of participants' definitions of the situation, noting patterns, themes, categories, and regularities (Cohen et al., 2018). The data was analysed through thematic analysis. This involved organising and explaining the data, that is, making sense of the data in terms of the participants' definitions of the situations, noting patterns, themes, categories, and regularities (Cohen et al., 2018). Themes appear as major findings in qualitative studies and are mostly used as headings in the findings section of research studies. They represent multiple perspectives from individuals and are supported by diverse quotations and specific evidence (Creswell & Creswell, 2023). Thematic analysis was chosen for its ability to facilitate a deep understanding of the data. Data collected through interviews, observations, and focus group discussions was transcribed using audio transcription whereby spoken words and non-verbal cues were put into texts format and document transcription. This was done according to the predetermined order of questions.

The recorded data was verified for accuracy and completeness, and in cases where translation from the original language to English was necessary, the translation was done. The data was

categorised according to the objectives. The major categories were: teachers' understanding of contextual lessons, learners' understanding of contextual lessons, assessment of how teachers present their lessons, and challenges in the delivery of contextual lessons. Under these categories, the researcher derived subcategories. The responses from the interviews, focus group discussions, and the results from observations were based on the subcategories and then coded. The coded data was finally analysed using SPSS. The outputs that the researcher used were frequencies that showed the frequencies of different codes or themes and charts that showed visual representation of the data in this study the researcher used a pie chart to illustrate patterns or distributions of coded themes. Coding is a process of organising the data by bracketing chunks and writing words representing a category in the margins (Rossman & Rallis, 2011).

### **3.6 Trustworthiness**

Trustworthiness or rigor of the study refers to the degree of confidence in data interpretation and methods used to ensure the quality of a study (Polit & Beck, 2022). A research study is considered trustworthy if there is dependability, credibility, confirmability, and transferability, among others. Transferability, dependability, and confirmability of a research study can be achieved through member checking and peer debriefing (Cohen et al., 2018). In this research study, dependability was achieved through peer debriefing. This was done by having an outside researcher conduct an inquiry audit on the study. Credibility was achieved through triangulation and peer debriefing. Triangulation refers to using different data sources to build a coherent justification for themes by examining evidence from those sources (Creswell & Creswell, 2023). Confirmability was achieved through member checking of data, and the researcher provided an audit trail that details each step of data analysis. Transferability of the research was achieved by providing a thick description of the data collection process and the context of the study in the final report. Thick description involves the researcher elucidating

all research processes, from data collection to the production of the final report (Anney, 2014). The researcher conducted a pilot study to check the effectiveness of the data collection instruments. A pilot study asks whether something can be done and if the researcher should proceed with it, and if so, how. A pilot study is important for improving the quality and efficiency of the main study (In, 2017).

### **3.7 Ethical Consideration**

The researcher followed ethical measures. Ethical approval (Appendix I) was obtained from the Mzuzu University Research Ethics Committee (Mzunirec) to ensure that the involvement of participants in data collection aligns with local and international guidelines. Permission to collect data in schools was obtained from the District Education Manager for Mzimba North, as well as from the head teachers of the selected schools and all the participants prior to the start of the study (Appendices VII, VIII, and IX). Additionally, participants were informed about the nature and purpose of the study, and consent forms were signed. Due to confidentiality reasons, the signed forms are not attached here, but the form itself has been included in Appendix III. According to Naqvi (2012), researchers should ensure that the information provided is never used for any purpose other than the intended one, and that it does not infringe upon the participants' right to privacy. The researcher did not use the names of the participants or the schools where they teach. There were no special promises made to participants to be honoured upon their participation in the research study. The rights of those who did not wish to participate or wished to withdraw were respected, although there were no such instances.

## **CHAPTER FOUR: RESULTS AND DISCUSSION**

### **4.0 Introduction**

This chapter presents the culmination of extensive research and analysis conducted to address the objectives outlined in the preceding chapters. Through data collection and outcomes obtained from the research methodology employed, the chapter serves as a comprehensive examination of the findings offering insights, interpretations and implications derived from the results.

### **4.1 Teachers Understanding of Contextual Teaching and Learning**

The first objective was to determine the knowledge and understanding of CTL among teachers and learners. This information was gathered through interviews and class observations. According to Dewi and Primayana (2019), CTL is a method of presenting lesson material by exposing students to real-world problems that need to be solved in order to achieve educational goals. Table 4.1 presents the teachers' understanding of CTL based on the standard definition mentioned above, their knowledge of how to assess the achievement of contextual teaching and learning, and their understanding of how to introduce a contextual lesson and engage learners in activities to achieve a contextualised lesson.

Table 4.1: Teachers understanding of contextual teaching and learning

No.	Contextual learning approach	Teachers' understanding	Frequency
1.	Explanations	i. Application of knowledge taught in class to students' everyday life settings.	6
		ii. Using learners' experiences to teach.	4
		iii. Showed no understanding of contextual teaching and learning.	2
2.	Knowledge on measurement of achievement of learning	i. Problem solving tasks and projects	3
		ii. Authentic assessments and projects, inquiry-based learning	4
		iii. Projects and end of term exams	5
3.	Knowledge on introduction of a lesson contextually	i. By asking learners questions from known to unknown	7
		ii. Asking learners questions on their experiences in relation to the lesson of the day	2
		iii. Asking random questions from the previous lesson	1
		iv. Using teaching and learning resources in relation to the lesson and asking questions based on the displayed	1
		v. Using case studies	1
4.	Knowledge on activities used in achieving a contextual lesson	i. Investigations and projects	2
		ii. Groupwork, experiments and collaborative learning.	7
		iii. Field visits, assessments and projects	1
		iv. Investigations and field visits	2

#### **4.1.1 Teacher explanations**

To establish the teachers' understanding, the researcher checked if the teachers could explain how they understand contextual teaching and learning based on the standard definition. According to Dewi and Primayana (2019), CTL is a way of presenting lesson material by exposing students to problems that must be solved in order to achieve educational goals associated with everyday life. Respondents were assessed in reference to this definition.

From Table 4.1, at least half of the respondents demonstrated that they understood what contextual teaching and learning is all about. For example, one of the respondents explained that "Contextual teaching and learning is a kind of lesson where teachers facilitate learning concepts that can be applied to learners' everyday lives". The next respondent explained that "contextual teaching and learning is when teachers teach using examples that are familiar to learners, and learners are able to grasp concepts that they can use at home". The other 4 respondents had similar explanations that were summed up as one explanation as they had the same major points. The explanations of the 6 respondents agrees with what Hakim and Sari (2023) explained on contextual teaching and learning that it is an approach which connects learning materials with real life applications within the contexts of students' lives and encourages students to find the meaning of what they have learnt on their own.

Four of the respondents responded in a similar manner, and their answers were categorized as one explanation which is "using learners' experiences to teach. For example, one respondent among the four explained that contextual teaching and learning is when you teach what students already know in order to make a connection with the new information and use it in their everyday lives. This is in agreement with the paradigm that guided the study which is the constructivism. It emphasises on using learners' previous experiences and them generate meaning out of those experiences (Clark, 2018). The last respondent in this category explained

that "contextual teaching and learning refers to using teaching and learning resources that learners already know and their experiences so that they can understand the concepts better". This category of respondents did not fully explain to at least match the standard definition of contextual teaching and learning. This agrees with the definition by Welerubun et al. (2022) who explained that contextual teaching and learning is a learning process that helps teachers relate subject concepts to real-world situations and student engagement to find material learned and connect in everyday life.

Two of the respondents admitted that they do not know the term contextual teaching and learning. However, after explaining to them what the term means, they were able to get the idea and contributed to the follow-up questions. This revealed that they could be applying this kind of teaching without knowing. Nevertheless, the application cannot be effective since it is done without any strategies. In order for students to be interested in learning, the teacher needs to increase the knowledge that they have on CTL such as connecting student knowledge with real conditions or student experience so that students will be interested in learning and not bored (Afifah et al., 2023).

#### **4.1.2 Measurement of achievement of learning**

The other aspect that was examined in relation to teachers' knowledge and understanding of CTL was whether respondents knew how to measure the achievement of contextual teaching and learning. This information was obtained through interviews. According to Glynn and Winter (2004), some of the measures of achievement of learning are problem-based learning, project-based learning, authentic assessments, cooperative learning, and inquiry-based learning.

To enhance brain performance, teachers must create conditions that involve asking thought-provoking questions and presenting facts that challenge students' thinking or present alternative perspectives. If learning is aimed at promoting high-level thinking processes, the

learning process must stimulate brain activity. Learning that is connected to real-life contexts can inspire students to engage in high-level thinking. Through the process of analysing problems presented by the teacher, this can serve as valuable evaluation material and contribute to addressing real-life problems (Haryanto & Arty, 2019).

The results presented in Table 4.1 indicate that the teachers had some knowledge of how to measure the achievement of contextual teaching and learning. This is in agreement with literature that highlights various ways of measuring contextual teaching and learning, including problem-based learning, authentic assessments, cooperative learning, inquiry-based learning, and project-based learning, as noted by Glynn and Winter (2004). Each respondent mentioned at least one or two of these approaches to measuring contextual teaching and learning.

The most commonly mentioned method by all respondents was the use of projects. For instance, the first respondent stated, "at some point I gave my learners a project to create and sell toys in order to generate income for themselves. This was both a class project and an individual project that was presented and explained in class." This approach is commendable because if learners can accomplish such tasks in school, they can apply the same skills in their everyday lives. This finding agrees with the study conducted by Uslan et al. (2021), which revealed that CTL empowers students to actively construct their understanding and apply it in their daily lives. This means that CTL fosters not only the comprehension of academic content but also the integration of that knowledge into students' behaviours in everyday life. The next respondent explained more after mentioning enquiry-based learning, and he further gave an example of how he could conduct an enquiry-based lesson. He said that "since his school is close to a hospital, he could send the learners to inquire from the hospital personnel on nutritional deficiency diseases, especially in children, since they have a child feeding project".



This is interesting, but when asked if he has ever done that, he said he had never done it due to time constraints. This shows that the knowledge is there, but it is not being put into action. Five respondents mentioned projects and end-of-term exams. One particular respondent said that "end-of-term exams measure all aspects of learning since they also conduct practical assessments".

Although the respondents displayed some knowledge, during class observations, they could not put the knowledge they displayed into action. More especially, those that mentioned problem-solving tasks. The problems to solve were verbal questions directed to individual learners and brief group discussions. However, the questions they were asking were not thought-provoking as they were direct questions that were coming from the lessons that were previously taught. These questions mainly encouraged memorizing skills rather than critical thinking skills. This result disagrees with Al Hakim et al. (2018), who wrote that, education is focused on an attempt to teach thinking skills rather than just teaching the content of the subject matter. The objective is that the students would have the ability to think critically. Critical thinking could be categorized as a higher-order thinking skill in which critical thinking is a clear and directed thinking process, which is used in mental activities such as problem-solving, decision making, and analysing assumptions. With this idea, teachers must make sure that they are giving learners questions or problems that challenge them and make them think deeper and critically rather than memorizing content. This was contrary to what was observed despite respondents displaying some knowledge on the measurement of CTL.

#### **4.1.3 Introduction of lesson contextually**

Respondents' ideas on this sub-objective were in line with the recommended way of introducing a contextual lesson. No respondent was completely incorrect in their statements. Two of the respondents mentioned that a contextual lesson can be introduced by asking

learners about their prior experiences related to the topic of the day. One of the respondents stated, "you can introduce a contextual lesson by asking learners about their experiences on a specific topic. For example, a teacher could ask learners what kind of food they give to sick people at home, and then more questions could be developed from the responses to eventually introduce concepts related to invalids and convalescents." This is in agreement with Haryanto and Arty (2019), who wrote that the real-life based learning approach is centred around choosing an event, situation, living entity, or inanimate object that students are familiar with in their daily lives as a context to initiate and shape the learning process (Aydin-Ceran, 2021).

Contextual learning can be implemented by consistently connecting the lesson material with students' daily experiences. Therefore, the introduction should always aim to link the lesson to learners' prior experiences. Special attention was given to one particular respondent who mentioned that resources can be used to introduce a contextual lesson. Greene (2015) also agrees with this particular response by stating that in the contextual teaching and learning (CTL) classroom, students actively engage with the material and the classroom becomes a learning community where real-life situations are experienced. Based on the classroom observations, the participants did not apply the contextual approach to introducing the lesson; instead, they solely relied on asking questions from previous lessons. This clearly indicates that although they had some knowledge of the appropriate introduction of a contextual lesson, they were not implementing it in their classrooms. Three respondents mentioned that a contextual lesson should be introduced by asking learners questions related to the topic of the day. However, this was not very clear and it demonstrated their uncertainty regarding the introduction of a contextual lesson.

#### **4.1.4 Activities in achieving a contextualised lesson**

Another aspect in assessing the knowledge of teachers and learners on contextual teaching and learning was to determine whether teachers are aware of the activities they can engage learners in to achieve a contextualised lesson. One respondent mentioned investigations and projects, stating that "a teacher should engage learners in investigations and projects in order for them to develop investigative skills and critical thinking skills". These activities could help students to think critically and analyse situations or their own projects, which can benefit their lives. Half of the respondents mentioned group work and projects. One of them highlighted that "it would be beneficial for us to have different activities such as group work, simple experiments, and collaborative learning in order to achieve a contextual lesson. Unfortunately, we mainly rely on question and answer and group work due to lack of resources and time". This is agreeing with what Greene (2015) stated about cooperative learning, which is also known as collaborative learning. He explained that it is a method that promotes group learning rather than individual or competitive learning. Collaborative learning involves small groups of two to four students working on small tasks and larger assignments. Two respondents mentioned assessments and projects, while one respondent mentioned investigations and field visits.

The responses agree with Suryawati and Osman (2017), who explained that science emphasizes inquiry and problem-solving methods. Scientific and thinking skills are utilized in the process of inquiry and problem-solving. Scientific skills are essential in any scientific investigation. Scientific methods such as experiments, research, and projects are activities that employ scientific skills. When solving problems in their surroundings, students can discuss, assist each other, and share experiences with the learning community, which sparks curiosity. Curiosity, in turn, increases students' interest in learning, making them more motivated to learn enthusiastically. Exposure to authentic problems can motivate students and improve their

academic achievement. Hudson and Whisler (2007) also emphasizes the different types of learning scenarios, namely: project-based, goal-based, and inquiry-oriented.

Based on the teachers' responses, it was found that they have ideas about the activities in which learners should engage in order to achieve contextual learning. However, due to various challenges, they are unable to involve learners in all the mentioned activities except for group work. This was also observed during lesson observations, as group work was consistently utilized in all the observed lessons. Group work is part of learning community teaching and learning activities. Al Hakim et al. (2018) explain that teachers must create a learning community through group discussions. The students' findings are correct according to their own perspectives. However, through the process of discussion, where various arguments, reasoning, and conclusions are debated, their findings are continuously tested against other arguments.

The study also examined the learners' knowledge of contextual teaching and learning. This was assessed in terms of the concepts they learn in school, how they apply those concepts in their daily lives, and the benefits they gain from acquiring knowledge in those concepts. The information was obtained through focus group discussions with five students engaged in each school. The learners were asked questions such as: what concepts do you learn in science? How do you apply these concepts for personal and societal benefits? When asked these questions, many learners could not remember most of the concepts and only mentioned a few. Furthermore, the same concepts were repeatedly mentioned across all visited schools. Therefore, the results represent the overall responses from the discussions conducted in all six schools. The concepts that were mentioned include food preservation and the nervous system, mentioned by 16.7% of the learners. Another 16.7% mentioned technologies for marketing and domestic use. 50% of the learners mentioned methods of cooking, food preservation, invalids, and convalescents. Lastly,

16.7% mentioned food preservation, methods of cooking, and technologies for marketing.

#### **4.1.5 Learners' knowledge on contextual teaching and learning**

The researcher also examined the knowledge that learners have on contextual teaching and learning. This was assessed in terms of the concepts they learn in school, how they apply these concepts in their daily lives, and the benefits they gain from acquiring knowledge related to these concepts. The questions posed to the learners were as follows: (1) What concepts do you learn in science? (2) How do you apply these concepts to benefit yourself and society at home?

The concepts that were mentioned include family size, income and food supply, food preservation, and the nervous system, which was mentioned by four learners. Ten learners mentioned technologies for marketing and domestic use, as well as improving the nutritional value of food. Three learners mentioned methods of cooking, food preservation, care for invalids and convalescents. Lastly, six learners mentioned food preservation, cooking methods, and technologies for marketing. Two learners mentioned the topics of improving traditional kitchens and technologies for environmental conservation. Additionally, five learners mentioned improving the nutritional value of food and food preservation.

#### **4.1.6 Application of the concepts to learners everyday lives**

The second question was to find out how learners apply the knowledge gained from the concepts in order to benefit themselves, their families, and their communities. Fink (2013), in his taxonomy of significant learning, suggests that application means learning how to perform a new kind of action. He further suggests that application means students take what they have learned and apply it to a different scenario, often outside the classroom. For example, students could use a math formula they have learned to calculate a family budget.

Learners must learn in a way that enables them to benefit from the knowledge gained, and also

allows their families and society to benefit from them. Judging from the responses obtained from the focus group discussions, it is evident that learners know how to apply the knowledge from the classroom. However, most of the time, only a few learners are allowed to handle learning materials during demonstrations, so they do not fully experience what they are supposed to do.

The responses given by learners in the focus group discussions were that concepts such as food preservation helped them solve problems of wasting food. For example, one respondent from school A said, "When we buy a lot of meat, instead of using it all in one meal, we can preserve it for another day by smoking it and storing it." Another respondent from school B said, "We can freeze tomatoes and use them later if we buy in bulk. They do not rot; hence they are preserved."

Another benefit highlighted by the respondents from the focus group discussions was that of income generation. They explained that what they learn from technologies for marketing helps them create things like toys and other artifacts. For example, one respondent from school B again admitted, "I tried to make toy cars at home using locally available resources with the knowledge I acquired here at school, and I sold them. The money was used to pay the school fund fee."

The other concept mentioned by the learners pertains to the nervous system. The respondents explained that learning about their bodies helps them understand how the nervous system functions and enables them to adopt healthier behaviours. Furthermore, they are able to share this knowledge with others in their respective societies. For instance, a respondent from School C stated, "In our communities, many young people are smoking marijuana and losing control. We are learning about the effects of drug and substance abuse, and we educate others about the dangers of smoking marijuana. The acquired knowledge also helps us refrain from engaging in such harmful behaviour."

In addition to promoting healthy behaviours, a respondent from School F highlighted that studying about invalids and convalescents enables learners to understand the appropriate foods to provide to those who are sick or in recovery. A respondent from School B provided an example, stating, "Sometimes, due to lack of knowledge, people do not give sick individuals vegetables or fruits; rather, they choose to offer meat and other animal products because they believe that a sick person should eat indulgent food. This misguided understanding hinders recovery since vegetables contain vitamins." The respondent further added that they have learned about the importance of vegetables and their vitamin content, which can boost immunity. Consequently, they share this knowledge with their guardians and parents.

Another respondent from School E mentioned, "We benefit from what we learn in science by enhancing our environment. For instance, we have been taught how to improve traditional kitchens by incorporating modern utensil storage areas." Concerning the concept of improving the nutritional value of food, some learners from School A and School D indicated that they had learned new ways to enhance the nutritional value of their regular meals. For instance, a learner from School A expressed, "I was unaware that one could add eggs or milk to ngaiwa porridge, but now I am well-informed. This can contribute to better health."

## 4.2 Assessment of how teachers present their lessons

Table 4.2: Assessment of how teachers present their lessons

Themes	Lesson aspect	Observations	Frequency
Learning environment	i. Resource availability	1. Teaching and learning resources available and present	5
	ii. Classroom science displays	2. Diagrams and pictures of different science and technology concepts displayed on classroom walls.	9
Lesson presentation	i. Suitability of introduction	1. Connection of new concepts to learners' everyday experiences	4
	ii. Effective use of resources	2. Ability to use resources to supplement verbal explanation	3
	iii. Learners' participation in activities.	3. Encouraging learners to solve problems and build knowledge by actively participating in activities.	4
Connection of activities to real life	i. Nature of examples used	1. Examples that support students thinking ability	4
	ii. Nature of lesson activities given.	2. Giving activities that employ seven CTL standards.	2
Strategies in application of contextual teaching	i. Provision of adequate time on tasks	1. Teachers that provided adequate time on tasks.	6
	ii. Promotion of interaction between teacher and students.	2. Teachers that encouraged learner participation.	5
	iii. Learners' participation.	3. Lessons that had high learner participation in activities	4
	iv. Pace of the lesson	4. Lessons that were well paced	6
Assessment	i. Provision of assessment based on what learners learnt.	1. Teachers that gave assessment connected to the lesson.	5
	ii. Provision of adequate time on assessment.	2. Teachers that provided adequate time on tasks.	3



#### **4.2.1 Learning environment**

One aspect of assessing how teachers present contextual lessons is the learning or teaching environment. According to Welerubun et al. (2022), the application of CTL is expected to create an interesting atmosphere for learning, making learners' activities more meaningful. The CTL model can provide a pleasant and active learning atmosphere, as learners can directly observe the surrounding environment and improve their outcomes (Darmawan & Kemdikbud, 2013). Table 4.2 shows that out of the 12 teachers whose lessons were observed, 5 had appropriate resources available. According to Davtyan (2014), learning occurs more quickly when students can use equipment and materials and engage in active research. However, the resources that the teachers had for their lessons were not sufficient for their large classes. It is important for each learner to have their own learning materials, or for materials to be shared in small groups. Unfortunately, this was not the case in all of the observed primary schools. In terms of science displays in the classrooms, Table 4.2 shows that 9 out of 12 classrooms had science displays. This allows learners to relate to the displayed diagrams while they are learning. This is in agreement with Davtyan (2014) who argues that educators must be clever in designing learning environments that can be easily connected to real life. In this type of environment, students can find connections between abstract ideas and everyday situations in the real world.

#### **4.2.2 Lesson presentation**

A contextual lesson must demonstrate its attributes right from the beginning. The introduction should be appropriate for the type of lesson being taught. In relation to CTL, four teachers from the observed lessons had a suitable introduction, as they were able to connect new concepts to the learners' prior everyday experiences.

Regarding the effective use of resources, it was discovered that only 3 out of the 12 observed

teachers utilized their resources effectively. For instance, a teacher from primary school B brought various types of vegetables to the class for learners to see and understand their health benefits. This action, as stated by Jacob and Furgerson (2012) and Awolaju (2016), is highly praised since instructional materials are meant to complement verbal explanations and make the lesson more tangible for the students. On the other hand, one of the respondents had charts with pictures of the brain under the topic "the nervous system," but she delayed using them until there was very little time left in the lesson period. As a result, learners were unable to study the charts adequately, and they did not effectively supplement their learning.

Out of the 12 observed lessons, only 4 had active learner participation in activities, as shown in Table 4.2. In the remaining lessons, learners were assigned tasks in groups, but only a few actively participated while the rest remained quiet and idle. The teachers merely stood in front without supervising the activities, resulting in very low participation, except for the 4 lessons where teachers encouraged learners to participate by moving around the groups and supervising their work. For example, in one observed lesson, the teacher circulated among the groups and explained the activity to those learners who had not understood it. The 8 lessons without learner participation disagrees with Rozimela et al. (2024), who says that students are expected to be familiar with problem-solving and construct their own knowledge through active participation in the learning process. This is supported by Suryawati and Osman (2017), who also emphasize the importance of students developing knowledge and experience through discovery and problem-solving activities in contextual teaching and learning. All of these activities require learners' active participation. One of the recommendations of the science and technology syllabus is that the lesson activities and materials should help learners construct their own knowledge. Only 4 lessons out of the 12 lessons were able to achieve this.

### **4.2.3 Connection of activities to real life experiences**

the nature of examples used and the nature of activities given to learners. These examples and activities were expected to be contextualised. Table 4.2 further demonstrates that out of the 12 respondents, 4 used contextual examples in their lessons while 8 did not. For instance, one teacher gave an example of drying vegetables at home and packing them in traditional leaf packages for preservation. He asked the students if they were familiar with this method, and all of them were. This is in agreement with the idea that CTL is suitable for primary students because it allows teachers to provide contextual examples that enhance students' thinking ability and promote an inquiry-based learning environment, even in online settings (Ilyas & Liu, 2020). This also agrees with Welerubun et al. (2022) research, which states that the CTL model enables teachers to directly provide examples from learners' daily environment. Five of the 12 lessons included contextualised activities that related to students' everyday lives.

Furthermore, in order to achieve a contextual lesson, the activities must also be contextual. Two lessons included contextualised activities, such as one respondent sending learners outside the classroom to pick flowering and nonflowering plants in groups and categorize them accordingly. This was commendable as it allowed learners to work together, think collectively, and come up with categories. According to Wahyuningtyas and Wuryadi (2018), learning through the CTL Approach should embody seven CTL standards: constructivism, questioning, modelling, learning community, inquiry, authentic assessment, and reflection. By initially linking materials to activities that students commonly engage in, it encourages and motivates them to think more. During class observations, it was noted that the common classroom activities given to learners were group tasks. However, only a few students actively participated in these tasks, and the tasks often consisted of a single question asking students to list things. While group activities are beneficial when used appropriately, as they foster cooperative learning and encourage sharing,

responding, and communication among students, students who work individually may not make as much progress as those who work in groups (Davtyan, 2014).

#### **4.2.4 Strategies in application of contextual teaching**

On strategies in the application of contextual teaching, the study aimed to determine if learners were given sufficient time on tasks, if there was promotion of interaction between teachers and students, learners' participation, and the pace of the lesson. Table 4.2 shows that out of the 12 respondents, 6 teachers provided adequate time for the tasks in the lessons. For example, one respondent assigned group work for learners to discuss the effects of drug and substance abuse. They were given 10 minutes, which the researcher believed to be sufficient.

Another observation was to determine whether there was promotion of interaction between teachers and learners. Only 5 teachers were able to promote interaction. However, most of the interaction that occurred was in the form of question-and-answer tasks. Many learners were eager to answer questions posed by the teacher. Active learners' participation was observed in 4 out of the 12 lessons. This was evident as learners were seen talking and later presenting their work to the entire class. In these particular lessons, learners were frequently raising their hands to answer questions posed by the teacher. The syllabus recommends that the suggested activities should promote interaction among learners themselves and between learners and teachers. It was observed with reference to the science and technology syllabus recommendation that learners were interacting but not effectively. The teachers' guide document recommends that teachers should apply outcome-based strategies in their lesson delivery. It was noted and observed that only a 4 to 5 teachers were able to apply some of these strategies such as using learner centered approaches where learners could be put in groups, discuss concepts and share ideas. Teachers that promoted interaction between learners were in agreement with the situated cognition theory that guided the study. The theory emphasises that learning is a social process whereby there is

need for interaction for effective learning to take place (Wenger, 2011).

The number of teachers that were able to promote interaction between teachers and learners was too less and this is disagreeing with Sarwari and Kakar (2023), who wrote that teacher-student interaction is enhanced when students are motivated and encouraged by the teacher to participate in classroom discussions. Students are more willing to share their ideas when persistent encouragement is provided. Furthermore, students should be encouraged to understand that communication and discussions are effective ways to learn and develop critical thinking (CT) abilities.

Therefore, it is the responsibility of teachers to encourage learners to participate in class discussions and other tasks in order to facilitate interaction between learners and teachers, as well as among the learners themselves. Based on the results obtained from lesson observations, in all 4 lessons where teachers encouraged interaction, they primarily used the question-and-answer method. However, the concerning aspect was that the questions posed to learners were straightforward and did not encourage follow-up questions or deeper understanding and critical thinking.

#### **4.2.5 Assessment strategies**

The study focused on assessing the type of assessments given to learners, specifically whether they were based on what they had learned and if sufficient time was allocated for them. Among the twelve teachers surveyed, five provided assessments that aligned with the learners' learning outcomes, and three allocated adequate time for the assessments. These findings are presented in Table 4.2. The 5 teachers are in agreement with what several authors that highlighted that the curriculum and teaching approach (CTL) emphasizes the use of authentic assessments, which measure students' abilities in tasks that resemble real-world problems. Consequently, authentic assessments promote student-centred learning, with the teacher assuming the role of a facilitator

(Fatonah et al., 2013; Gleason et al., 2011; Hallas, 2008; Keiler, 2018; Villarroel et al., 2018). According to Uslan et al. (2021), performance assessments track the learning process, evaluating the students' progress based on their performance throughout the process.

### **4.3 Challenges in the delivery of contextual lessons**

Figure 4.1 provides the results of the challenges that teachers are currently facing, hindering them from effectively delivering contextual lessons. The common challenges mentioned include limited resources and large class sizes. For instance, one respondent expressed their concerns, stating, "We have a high number of students in each class. The teacher-pupil ratio is, on average, 1:80 in this school. It is challenging to conduct practical lessons, field visits, and follow up on individual projects. As a result, we end up relying on explanations alone. Additionally, the available resources are insufficient for each student to have a hands-on experience."

Six respondents mentioned the challenges of limited resources, large class sizes, and limited lesson time. Notably, two respondents highlighted the significant challenge of lacking training in implementing contextual teaching. One of them explained, "It is extremely difficult to carry out tasks for which we have not received proper training. We are unable to execute them effectively due to a lack of understanding of the underlying principles, as well as a shortage of practical materials and large class sizes." This agrees with the findings of Situmorang (2019), who discovered that the implementation of contextual teaching and learning faces challenges such as limited facilities for scientific methods, a lack of opportunities for teachers to develop contextually-based media, and insufficient support in terms of learning society and constructivism.

Furthermore, the limited time allocated for lessons leads to a focus on completing the syllabus and drilling students for national examinations. This is also supported by a study conducted by Harun et al. (2015) on the challenges of implementing contextual teaching, which found that

teachers' readiness to adopt contextual teaching on a daily basis was at a moderate level due to time constraints during teaching and learning sessions. Three respondents expressed their inability to deliver contextual lessons effectively due to large class sizes, making it challenging to manage all the required activities such as field visits and projects. The impact of large class sizes and limited resources significantly hinders the effective delivery of contextual lessons.

Regarding the challenge of large class sizes, it was observed that the average student-teacher ratio in all six schools was 1:80. This ratio is relatively high for government primary schools. Eunice et al. (2014), in a similar study, noted that practical lessons become extremely difficult to manage when teachers are faced with very large classes, leading them to resort to lecture-based teaching methods. These methods contradict the principles and strategies of contextual teaching and learning.

Three respondents also mentioned the challenges of limited resources, limited lesson time, and poor planning. When asked to elaborate on poor planning, one respondent stated, "Planning a lesson with limited resources and time is exceptionally difficult, resulting in poorly planned and consequently poorly delivered lessons." This response is consistent with the findings of Jasmi and Hin (2014), who identified time constraints, difficulty in constructing assessments, and a lack of contextual training as factors contributing to the difficulty in designing lesson plans.

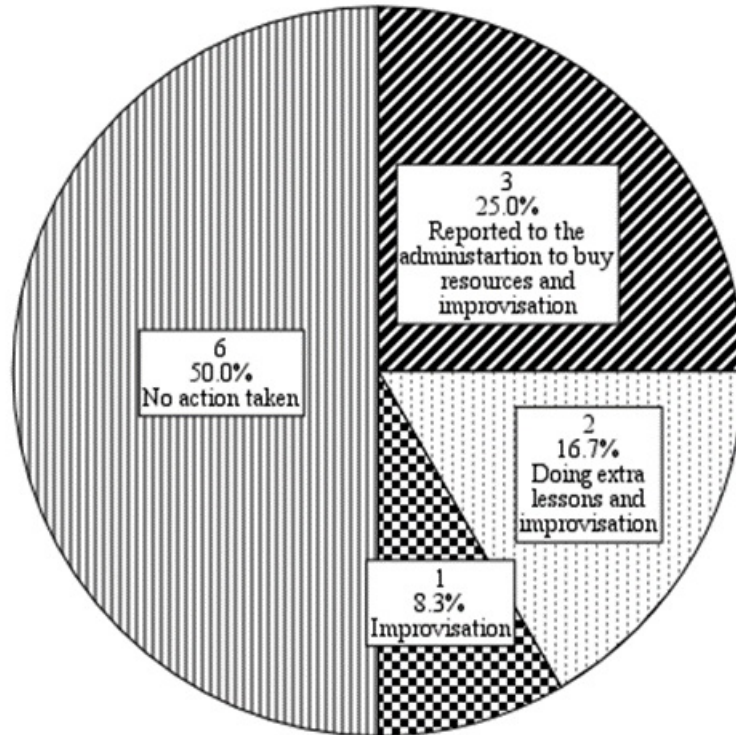


Figure 4.1: Challenges in the delivery of contextual lessons

#### 4.3.1 How the challenges are addressed

Respondents were asked whether they took action to address the challenges they encountered in delivering contextual lessons. Three respondents reported the issue of lack of resources to the head teacher, but their efforts proved unsuccessful. One of them explained, "We have reported the matter to the administration, specifically the head teacher, but it seems that the problem is beyond his ability to solve. This has prompted us to take initiative and improvise." However, despite this response, no improvisation in the classroom was observed. The other two respondents mentioned that, in cases of limited lesson periods, they ensure to engage in practical activities outside of regular school hours, after making suitable arrangements with the students and administration. One respondent expressed, "I make arrangements with the learners after consulting with the administration, and during extra lesson times, we conduct practical lessons that couldn't be done during regular hours due to time constraints."



On the other hand, half of the respondents stated that they had never taken action to address the challenges they faced. When asked to explain further, one respondent mentioned, "I simply take it for granted and try to work with what is currently available. I must acknowledge that your visit has made me reflect on what I can do to tackle the challenges we encounter in delivering contextual lessons. Trying, at least, is better than not attempting at all."

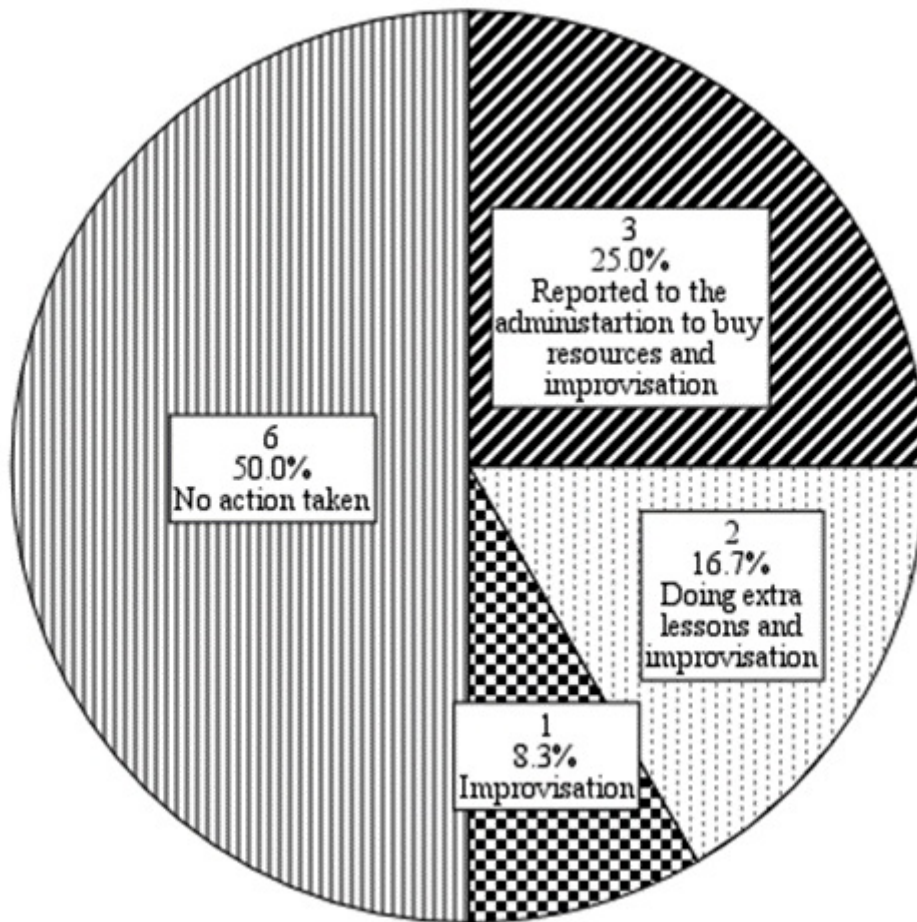


Figure 4.2: Actions taken to address the challenges

## **CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter provides an overview of the findings, a summary of the findings, conclusions, limitations of the study, recommendations based on the study findings, and areas for further research studies.

### **5.2 An overview of the findings**

This section presents an overview of the findings. This is what was discovered for each question. Firstly, the study investigated the understanding of contextual teaching and learning among teachers and learners. 50% of the teachers demonstrated a clear understanding of contextual teaching and learning, while 33% had a partial understanding. The researchers elicited further elaboration on the term "contextual" to assess their understanding.

For the learners, their comprehension was primarily assessed by their ability to apply the concepts they learn to their daily lives. During the focus group discussions, the learners explained how they apply these concepts by providing specific examples of application. For instance, 50% mentioned that the concepts helped them solve problems at home and generate income, while 16.7% indicated that technologies for domestic use saved them time. Additionally, some learners mentioned that certain concepts guided them in adopting healthy behaviours, and 33% shared that they benefited from knowledge in food preservation, problem-solving skills, and resource management.

Secondly, the study examined how teachers presented contextual science and lessons. Effective presentation of these lessons requires appropriate resources and opportunities for students to experience what they are learning. The results revealed that only 50% of the teachers had the necessary resources for their lessons. Regarding the provision of an optimal

learning environment, 75% of the classrooms displayed science materials. However, possessing resources and utilizing them effectively are two distinct considerations. From observations of lessons and teachers, it was discovered that only 25% of the teachers effectively employed the resources they brought into the classroom. Learner participation in all twelve lessons reached 67%, which was above average.

Furthermore, the adequacy of lesson introductions was rated at 33% for all the teachers. This means that only 33% of the teachers were able to introduce the lessons contextually, connecting prior knowledge to new concepts. This is unsatisfactory, as an effective introduction is fundamental to the success of a contextual lesson. It is during the introduction that learners establish their interest, understanding, and motivation.

In terms of contextual examples, only 33% of the teachers provided relevant and real-life examples that connected the lessons to practical experiences. However, these examples were solely provided by the teachers, without giving learners an opportunity to contribute their own examples. Only 17% of the lessons had contextual activities aligned with CTL strategies. These activities mainly consisted of group discussions. Approximately 50% of the teachers provided sufficient time for tasks, while 42% encouraged interaction between themselves and the learners. However, this interaction was often ineffective and monotonous. Good learner participation was observed in approximately 33% of the lessons, while 67% of the teachers effectively paced their lessons. Moreover, the researcher focused on the provision of assessment during lesson presentations. About 42% of the teachers conducted assessments based on the lessons, and 25% allocated adequate time for these assessments.

Regarding the last specific objective, the results of the study suggest that teachers encounter several challenges in delivering contextual lessons. These challenges include limited time and resources, large class sizes, lack of training in CTL, and poor planning. These factors hinder

the achievement of contextual lessons since adequate resources are necessary. Furthermore, contextual activities such as projects and experiments require sufficient time and close teacher supervision, which becomes unrealistic with high pupil-to-teacher ratios. Most observed classes had a teacher-to-pupil ratio of 1:90. Inadequate steps are being taken to address these challenges, and improvisation is often the only solution to overcome resource limitations. Additionally, teachers cannot effectively deliver contextual lessons without proper training.

### **5.3 Conclusion**

In conclusion, the assessment of teachers' understanding of contextual teaching and learning revealed different levels of knowledge and comprehension among different teachers. By examining their understanding of CTL concepts, ability to assess the achievement of contextual teaching and learning, and ability in introducing and engaging learners in contextual lessons, the study sheds light on the gaps and strengths in teachers' approach to implementing CTL strategies. The findings emphasise the importance of enhancing teachers' knowledge and skills in delivering effective contextual science lessons to foster meaningful learning experiences for students.

The evaluation of teachers' understanding of contextual teaching and learning revealed diverse interpretations and levels of comprehension among the respondents. While some teachers demonstrated a solid grasp of CTL by linking it to real-world applications and student experiences, others struggled to align their explanations with the standard definition. The findings emphasise the importance of enhancing teachers' awareness and proficiency in implementing CTL strategies effectively to ensure meaningful learning experiences for students.

The examination of teachers' knowledge regarding the measurement of achievement in contextual teaching and learning revealed a varied understanding of assessment strategies.

While respondents showed familiarity with assessment methods such as project-based learning and end-of-term exams, there was lack of compatibility between their knowledge and implementation during class observations. The study emphasizes the importance of aligning assessment practices with CTL principles to promote higher-order thinking skills and critical thinking among students. Teachers are encouraged to design assessment tasks that challenge students to think deeply and apply their knowledge in real-life contexts, encouraging a more comprehensive understanding of academic content and its practical relevance.

Based on the analysis of respondents' ideas and practices related to the introduction of contextual lessons and activities in achieving a contextualised lesson, several key findings have come up; Respondents generally aligned with the recommended approach of introducing contextual lessons by connecting them to students' prior experiences. While some respondents emphasized the importance of utilizing resources and asking questions related to real-life scenarios, there was also a mismatch between their knowledge and actual implementation in the classroom. The study underscores the need for teachers to bridge this gap and effectively incorporate contextual elements into lesson introductions to enhance student engagement and understanding.

The assessment of teachers' awareness of activities to achieve contextualised lessons revealed a variety of responses, with mentions of investigations, projects, group work, and collaborative learning. While respondents demonstrated an understanding of the benefits of such activities in promoting critical thinking and problem-solving skills, challenges such as resource constraints and time limitations hindered their full integration into classroom practices. The study highlights the importance of overcoming these obstacles to provide students with varied and engaging learning experiences that align with CTL principles.

The study looks deeply into the importance of aligning teaching practices with CTL

principles, fostering a deeper understanding of concepts through real-life connections, and providing students with varied and interactive learning experiences to promote critical thinking and application of knowledge in practical contexts. Addressing challenges such as resource limitations and time constraints is necessary to fully realizing the potential of contextual teaching and learning in enhancing student learning outcomes. The findings suggest that learners possess a solid understanding of the concepts taught in school and show a strong capacity to apply this knowledge in practical contexts for personal, family, and societal benefits. By fostering a learning environment that encourages active engagement, hands-on experiences, and real-world applications, teachers can further enhance students' ability to connect classroom learning with everyday experiences and contribute meaningfully to their communities.

In addition, creating an engaging learning environment, effectively presenting lessons with real-life examples, and incorporating activities that relate to students' daily experiences are necessary components of successful contextual teaching and learning. By encouraging active participation, utilizing resources effectively, and connecting lessons to real-life contexts, teachers can enhance students' learning experiences and promote deeper understanding and engagement in the classroom. Again, effective application of contextual teaching strategies involves providing adequate time for tasks, promoting meaningful interaction between teachers and learners, encouraging active participation, and implementing outcome-based and authentic assessment strategies. By fostering dynamic interactions, encouraging critical thinking, and aligning assessments with learning outcomes, teachers can create an engaging and effective learning environment that supports students' development and understanding.

Lastly, the challenges in delivering contextual lessons, such as limited resources, large class sizes, lack of training, and time constraints revealed in the study impact the effectiveness of

teaching practices. Addressing these challenges requires a combination of reporting issues, taking initiatives, engaging in practical activities outside regular hours, and reflecting on ways to improve the delivery of contextual lessons. By proactively dealing with these challenges, teachers can create a more conducive learning environment that enhances student engagement and understanding.

In conclusion, it is evident that primary school science teachers generally lack adequate knowledge of contextual teaching and learning. Consequently, they often teach without a clear purpose or goal for achieving contextual lessons. Most of the observed and interviewed teachers adhere to the same teaching protocol and style, without putting in much effort to incorporate contextual elements. They also fail to properly apply the necessary strategies for delivering contextual lessons. This can be attributed to challenges such as limited resources, high teacher-to-pupil ratios, and insufficient time for lessons. It is important to note that most students are aware of the importance of applying what they learn in their everyday lives. They simply require support and encouragement, which can be provided through assigning projects for them to complete at home. By supervising and assessing these projects, teachers can ensure that all students actively participate.

#### **5.4 Limitations of the study**

- The study was conducted solely in Mzimba North and only involved 6 schools. Therefore, it is not possible to generalize the results to all primary schools in Mzimba North.
- Additionally, the study focused solely on the subject of science. Thus, the findings cannot be applied to all subjects taught in primary schools.
- Furthermore, it is worth noting that the researcher employed a qualitative approach. It is important to acknowledge that utilizing different approaches may yield varying results.

## **5.5 Recommendations on the study findings**

- From the study results, contextual teaching and learning brings meaning to learners and adds value to the knowledge that learners acquire. The knowledge becomes useful to learners. Therefore, the following recommendations are made based on this study:
- The Ministry of Education should consider incorporating the concept of CTL into the curriculum of primary school teacher training colleges. For the study has revealed its relevance to meaningful learning.
- At the school level, the school authorities should regularly conduct insets that could help to strengthen teachers' capacity and ability to teach in line with CTL principles which emphasises learner centered teaching methodologies. This is to bridge the gap between teachers current understanding and the desired application of CTL principles in the classroom. In addition to this, teachers should receive comprehensive training on the improvisation of teaching and learning materials.
- Teachers should be empowered to report issues to the relevant authorities on issues that pose as a challenge in the effective delivery of contextual lessons. In addition to this, teachers should be encouraged to take initiatives engaging in practical activities outside regular hours.
- Follow-up activities, such as class supervision, should be conducted to ensure that teachers are applying the skills acquired during CTL trainings. These supervisions can be carried out by school authorities.
- During PTA meetings, parents should be encouraged to support their children at home by providing them with the necessary resources to apply what they learn in school.



## **5.6 Areas for further research studies**

Due to time and other constraints, the researcher has been unable to thoroughly explore all areas that require significant attention. Therefore, I recommend that future studies consider the following:

- The attitudes of science teachers toward contextual teaching and learning.
- The extent to which teacher training colleges incorporate contextual teaching and learning strategies (CTL) into their curriculum. This is important as it appears that primary school teachers may lack sufficient knowledge of CTL.
- The extent to which primary school learners apply the knowledge acquired in school to their daily lives.

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# APPENDICES

## Appendix I: Permission letter



**MZUZU UNIVERSITY**

**DIRECTORATE OF RESEARCH**

Mzuzu University  
Private Bag 201  
Luwinga  
Mzuzu  
MALAWI  
TEL: 01 320 7200  
FAX: 01 320 6400

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### MZUZU UNIVERSITY RESEARCH ETHICS COMMITTEE (MZUNIREC)

Ref No: MZUNIREC/DOR/23/88

27/07/2023.

Jean Nyirenda,  
Mzuzu University,  
P/Bag 201,  
Luwinga,  
Mzuzu 2.

[jnyirenda112@gmail.com](mailto:jnyirenda112@gmail.com)

Dear Jean,

**RESEARCH ETHICS AND REGULATORY APPROVAL AND PERMIT FOR PROTOCOL REF NO: MZUNIREC/DOR/23/88: CONTEXTUAL TEACHING AND LEARNING OF SCIENCE IN SELECTED PRIMARY SCHOOLS IN MZIMBA NORTH.**

Having satisfied all the relevant ethical and regulatory requirements, I am pleased to inform you that the above referred research protocol has officially been approved. You are now permitted to proceed with its implementation. Should there be any amendments to the approved protocol in the course of implementing it, you shall be required to seek approval of such amendments before implementation of the same.

This approval is valid for one year from the date of issuance of this approval. If the study goes beyond one year, an annual approval for continuation shall be required to be sought from the Mzuzu University Research Ethics Committee (MZUNIREC) in a format that is available at the Secretariat. Once the study is finalised, you are required to furnish the Committee with a final report of the study. The Committee reserves the right to carry out compliance inspection of this approved protocol at any time as may be deemed by it. As such, you are expected to properly maintain all study documents including consent forms.

Wishing you a successful implementation of your study.

**Committee Address:**

*Secretariat, Mzuzu University Research Ethics Committee, P/Bag 201, Luwinga, Mzuzu 2; E-mail address: [mzunirec@mzuni.ac.mw](mailto:mzunirec@mzuni.ac.mw)*

Yours Sincerely,



**Gift Mbwele**

**SENIOR RESEARCH ETHICS ADMINISTRATOR**

**For: CHAIRMAN OF MZUNIREC**

**Committee Address:**

*Secretariat, Mzuzu University Research Ethics Committee, P/Bag 201, Luwingu, Mzuzu 2; E-mail address: [mzunirec@mzuni.ac.mw](mailto:mzunirec@mzuni.ac.mw)*

## Appendix II: Letter of introduction



**MZUZU UNIVERSITY**

**Department of Teaching, Learning and  
Curriculum Studies**

Mzuzu University  
Private Bag 201  
L u w i n g a  
M z u z u 2  
M A L A W I

Tel: (265) 01 320 575/722  
Fax: (265) 01 320 568  
[mdolo.mm@mzuni.ac.mw](mailto:mdolo.mm@mzuni.ac.mw)

**8<sup>th</sup> August 2023**

### **TO WHOM IT MAY CONCERN**

Dear Sir/Madam,

**LETTER OF INTRODUCTION: MS JEAN NYIRENDA**

Ms Jean Nyirenda is a registered Master of Education (Teacher Education) Program student at Mzuzu University. She has been cleared by the Mzuzu University Research Ethics Committee (MZUNIREC) to collect data for the research study she is conducting as a requirement for the program.

Kindly assist her accordingly.

Yours faithfully,

**Dr Margaret M. Mdolo**  
**Program Coordinator**

## Appendix III: Informed Consent Form



Mzuzu University Research Ethics Committee (MZUNIREC)

### Informed Consent Form for Research in Masters in teacher education

#### Introduction

I am Jean Nyirenda from **Mzuzu university**. We are doing research on contextual teaching and learning in selected primary schools in Mzimba north district. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

#### Purpose of the research

This research aims at investigating the approach that primary teachers are taking in bringing about contextualized teaching and learning in selected primary schools in the northern education division in Malawi.

#### Type of Research Intervention

This research will involve your participation in focus group discussion, lesson observation and individual interview.

#### Participant Selection

You are being invited to take part in this research because you are one of the primary school science teacher / science students.

#### Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or



not. If you choose not to participate nothing will change. You may skip any question and move on to the next question.

### **Duration**

The research takes place for a period of **one year**.

### **Risks**

You do not have to answer any question or take part in the discussion/interview/survey if you feel the question(s) are too personal or if talking about them makes you uncomfortable.)

### **Reimbursements**

You will not be provided any incentive to take part in the research.

### **Sharing the Results**

The knowledge that we get from this research will be shared with you and your community before it is made widely available to the public. Following, we will publish the results so other interested people may learn from the research.

### **Who to Contact?**

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact: Dr Mdolo, Mzuzu University, private bag 201, Luwinga, Mzuzu 2. cell: 0993801059.

This proposal has been reviewed and approved by Mzuzu University Research Ethics Committee (MZUNIREC) which is a committee whose task it is to make sure that research participants are protected from harm. If you wish to find about more about the Committee, contact Mr. Gift Mbwele, Mzuzu University Research Ethics Committee (MZUNIREC) Administrator, Mzuzu University, P/Bag 201, Luwinga, Mzuzu 2, Phone: 0999404008/0888641486

Do you have any questions?

### **Part II: Certificate of Consent**

*I have been invited to participate in research about contextual science teaching and learning in selected primary schools in Mzimba north.*

**I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study**

**Print Name of Participant** \_\_\_\_\_

**Signature of Participant** \_\_\_\_\_

**Date** \_\_\_\_\_

**Day/month/year**

*If illiterate*<sup>1</sup>

**I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.**

**Print name of witness** \_\_\_\_\_

**Thumb print of participant**

**Signature of witness** \_\_\_\_\_

**Date** \_\_\_\_\_

**Day/month/year**

**Statement by the researcher/person taking consent**

**I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the research project. I confirm the participant was given an opportunity 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.**

**Signature of Researcher /person taking the consent** \_\_\_\_\_

**Date** \_\_\_\_\_

<sup>1</sup> A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb print as well.

**Statement by the researcher/person taking consent**

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the research project. I confirm the participant was given an opportunity 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.

**Signature of Researcher /person taking the consent**

**Date** \_\_\_\_\_

Day/month/year

## **Appendix IV: Interview guide for Teachers and learners**

### **Interview guide questions**

1. What is your understanding of contextual teaching and learning?
2. How would you measure the achievement of contextual learning in your pupils?
3. How do you introduce a lesson contextually?
4. What activities do you employ to achieve a contextualized lesson?
5. What challenges do you face in the delivery of a contextual lesson?
6. Have you ever attempted to take any action to address the challenges?

### **Interview guide questions for learners in focus group**

1. What are the concepts in science and technology that you have learnt in your class that are relevant to your life?
2. Explain how you apply these concepts so that they benefit you, your family and the community at large.

## Appendix V: Lesson observation guide

NAME OF SCHOOL \_\_\_\_\_ CLASS \_\_\_\_\_

SUBJECT \_\_\_\_\_ DATE \_\_\_\_\_

TIME \_\_\_\_\_ NUMBER OF LEARNERS \_\_\_\_\_

EVALUATION ITEMS	COMMENTS
<b>1. Learning Environment</b>	
1.1 Availability of resources	
1.3 Classroom displays for science	
<b>2. Lesson Presentation</b>	
2.1 Suitability of Introduction	
2.2 Effective use of the resources in the lesson	
2.4 Learners' participation in activities	
<b>3.0 Connections of activities to real life experiences</b>	
3.1 Nature of examples used	
3.2 Nature of lesson activities given to learners	
<b>4.0 Strategies in application of contextual teaching</b>	
4.1 Provision of adequate time on tasks	
4.2 Provision of supporting techniques	

4.3 Promotion of interaction between the teacher and students	
4.4 Challenges in delivery of contextual lessons	
4.5 Learners' Participation	
4.6 Pace of the lesson	
<b>5. Assessment</b>	
5.1 provision of assessment based on what they have learnt	
5.2 Provision of adequate time for assessment tasks to learners	

## **Appendix VI: Document analysis checklist**

### **Senior Primary School Science and Technology Syllabus**

1. Are the suggested activities promoting interaction among learners?
2. Are the suggested activities promoting interaction between teachers and learners?
3. Are the activities and materials helping learners to construct their own knowledge?

### **Senior Primary School Science and Technology Teachers guide**

Are teachers applying outcome-based teaching strategies?

## Appendix VII: Permission letter to the District Education Manager

Mzuzu University

P/ Bag 201

Luwinga

Mzuzu 2

The DEM  
Mzimba District  
Box  
Mzimba  
20th October, 2023

Dear Sir

SEEKING FOR PERMISSION TO COLLECT DATA IN PRIMARY SCHOOLS IN  
MZIMBA DISTRICT

I am a student from Mzuzu University doing research on contextual teaching and learning of science in Primary Schools as partial fulfilment of the requirements for the award of a Degree of Master of Education in Teacher Education. The study is based in Mzimba District. Therefore, I Would like to seek for permission so that I collect data in primary schools in your district. The schools will be randomly sampled. The data will be collected and used for the stated purpose, nothing else and in line with ethical rules.

Attached is the letter of introduction from Mzuzu university.

Thanks in advance for your assistance.

Yours sincerely,

Jean Nyirenda.



## **Appendix VIII: Permission letter to headteachers of schools in Mzimba**

### **District**

Mzuzu University  
P/Bag 211  
Luwinga  
Mzuzu

The Head teacher  
C/O Box 38  
Mzimba District  
20<sup>th</sup> October, 2023

Dear Sir/Madam

#### **SEEKING FOR PERMISSION TO COLLECT DATA IN YOUR SCHOOL**

I am a student from Mzuzu University doing research on contextual teaching and learning of science in selected primary schools in Mzimba as partial fulfilment of the requirements for the award of a Degree of Master of Education in Teacher Education. The study is based in Mzimba North District. Therefore, I Would like to seek for permission so that I collect data in your school. The data collected will be treated with confidentiality and used for the stated purpose and in line with ethical rules. The teachers I seek to interact with for the study are science teachers from standard 7 and 8. I would like to have 1 teacher from each class. The activity will involve document analysis of teachers guide and syllabus followed by face-to-face interview s and lesson observations. Note taking be done during interviews and lesson observations using an interview guide and lesson observation guide.

Attached is the letter of introduction from Mzuzu university and the DEM Mzimba.

Thank you in advance for your assistance.

Yours Faithfully,

Jean Nyirenda.

## **Appendix IX: Letter of introduction and request for permission**

C/O Mzuzu University  
Private Bag 201  
L u w i n g a  
M z u z u  
20<sup>TH</sup> October 2023

**TO WHOM IT MAY CONCERN**

### **LETTER OF INTRODUCTION AND A REQUEST FOR PERMISSION**

I am a postgraduate student of Mzuzu University carrying out a study on contextual teaching and learning in primary schools in Mzimba north. I kindly request you to voluntarily participate in the research so that accurate data is collected. The data that will be collected from you will be handled will be used only for the purpose of this study and no other purpose apart from this. There will be face to face interviews followed by lesson observations done alongside document analysis. The documents to be analyzed will be the science and technology syllabus and teachers guide. Note taking will be done during face-to-face interviews and lesson observation to make sure all information is captured for the research. So, you are therefore kindly requested to participate freely, the information provided will be treated with utmost confidentiality and will be used only for the purpose of this study.

I would like to thank you in advance for taking part in this study.

Yours sincerely,

Jean Nyirenda