

**PRIMARY TEACHERS' CONCEPTUAL UNDERSTANDING AND
IMPLEMENTATION OF COMPONENTS OF A SCIENCE LESSON PLAN IN
THREE SELECTED PRIMARY SCHOOLS OF CHIBOLYA ZONE, LUSAKA
DISTRICT**

BY

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**A Thesis Submitted to The University of Zambia in partial Fulfillment of the
Requirements of the Degree of Master of Education in Primary Education**

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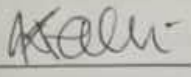
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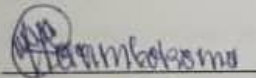
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DEDICATION

This study is dedicated to my children; Chisenga, Eunice and Bufwayo. I also dedicate the study to the Mambwe Family and Mother Theresa Missionaries of Charity in Mtendere.

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ABSTRACT

This study sought to examine the primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone in Lusaka District. The study explored the primary teachers' conceptual understanding of the components of a science lesson plan, determined what primary teachers write on the components of a science lesson plan and found out how primary teachers implement of written science lesson plans. This study employed a pre-experimental survey design, which allows for a mixed approach. The study sample consisted of thirty (30) primary school teachers from the three selected primary schools in Chibolya Zone of Lusaka District. The three primary schools were selected randomly out of the five schools in Chibolya Zone. The thirty (30) teachers were purposively chosen. Data was collected using a questionnaire, document analysis and observation schedule. SPSS was used to generate descriptive statistics as tests of significance were not the goal of the study. Thematic analysis was used to categorise data qualitative data broadly as befits a pre-experimental survey design. The findings of the study revealed that the majority of primary teachers either possessed knowledge of the components but failed to apply them in practice, or lacked understanding of the components but still incorporated them into their lesson preparation. The findings showed that primary teachers had a relatively shallow conceptual understanding of the various components of a lesson plan as evidenced in the conceptual knowledge test. The findings of the study also revealed that some teachers' lesson plans did not have some components that are fundamental in lesson delivery. Lastly, statistical evidence showed there were discrepancies between what was written in the lesson plans and what was being implemented in the lessons. Based on the findings, it is recommended that a policy could be suggested to introduce mandatory continuous professional development as a potential development for teachers to acquire skills for planning to teach. It is recommended that there could be clear teacher requirements in schools in terms of the appropriate design and format of the lesson plans by teachers. Lastly, in strengthening compliance to lesson plan implementation, more classroom inspections should be undertaken.

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ABBREVIATIONS AND ACRONYMS

CPD	Continuous Professional Development
GRZ	Government of the Republic of Zambia
INSET	In-Service Training
IPeK	Improvement of Pedagogical Content Knowledge
JICA	Japan International Cooperation Agency
MOGE	Ministry of General Education
PEO	Provincial Education Officer
7NDP	Seventh National Development Programme
SMASTE	Strengthen Mathematics, Science and Technology Education
ZEEP	Zambia Education Enhancement Programme

CHAPTER ONE: INTRODUCTION

1.0 Overview

This chapter provides the background to the study, the statement of the problem and the general research objective of the study. It also presents the specific objectives and research questions of the study. Lastly, it explains the significance, delimitation, operational definitions used in the study as well as the limitations of the study.

1.1 Background of the Study

The process of producing a product is a vast and complex activity that requires all necessary procedures to be undertaken carefully and accurately (Artaya, 2018). In order to create a product or service to meet the needs of consumers, it takes all the elements in the process of construction so that the resulting product or service can be something complete and satisfying to the consumers. Similarly, in order to create a lesson plan that would meet the needs of the learners, it takes understanding and putting together all its components so that the resulting lesson plan is complete and satisfying to the learners. Whatever approach is taken, the research evidence points to the fact that the end-product, the lesson plan, is often arrived at through a variety of processes that requires a conceptual understanding of the components (John, 2006).

Writing a lesson plan and all its components is one thing and understanding what each of the components of the lesson plan means and how to implement it in a classroom setup is another. Much research has been conducted on lesson planning dynamics (Cevikbas *et al.*, 2023), identifying the components of a lesson plan, the importance of a lesson plan (Jabeen and Karim, 2021), delivery of a lesson (Opanga and Nsengimana, 2022) and evaluation of a lesson plan (Cevikbas *et al.*, 2023). In addition, literature indicates that lessons in science exhibit less adherence to what the components of the lesson plans demand (Abid, 2021). These findings implied that teachers were not able to adhere to the demands of lesson plan components due to lack of conceptual understanding of the components of a lesson plan (Abid, 2021). At the time of this study, no study was found, conducted on the primary teachers' conceptual understanding and implementation of the components of a science lesson plan. There is an emphasis on understanding the

components for a lesson plan in order to be successful in adhering to their demands as they pull together the thinking into a clear, definable classroom guide (Adam, 2014). Furthermore, Jahjouh (2014) stresses that efficient lesson delivery is a product of a well-designed lesson plan that meets the needs of the learners.

A lesson plan is a vital document in the teaching and learning process. Shen *et al.* (2007) mentions that lesson planning allows teachers to explore multiple aspects of pedagogical content knowledge. This entails that during planning, a teacher has more chances of exploring key knowledge and eventually plan for better ways to deliver it. For a teacher to enter a class prepared is vital to the teaching and learning process. Following this premise, we can deduce that efficient lesson delivery becomes a resulting product of a well-designed lesson plan that meets the needs of the learners (John, 2006). In addition, planning does not just help the learners to learn effectively, but it also helps the teacher to deliver the lessons effectively.

According to Milagro (2009) the lesson plan stresses the core elements that have to be understood if a lesson is to be successful, and, thus, pulls together the thinking into a clear, definable classroom guide. It is not enough to just write a lesson plan, but every teacher should ensure that he or she has a clear understanding of the key components that makes a lesson plan stand out as a clear guide to effective teaching and learning. Milagro (2009) presents the basic principles and components of lesson planning by organizing them into three different stages: before planning, while planning, and after planning. In a nutshell, it is clear that before planning, the teacher ought to ensure that he or she does a clear research on the topic in question. During planning, all activities that may take place in class should be anticipated and well planned for. Finally, after planning, it is good to conclude and evaluate the lesson (Egan, 2005). Gluing all these components together in one document becomes a perfect guide to lesson delivery effectiveness. Therefore, conceptual understanding of the components of a lesson plan is vital.

Since 2004, the Government of the Republic of Zambia has worked with Japan International Cooperation Agency (JICA) to integrate lesson study, into the Zambian teacher development programmes (Robinson, 2015). In the same vein, the project for Improvement of Pedagogical Content Knowledge (IPeCK) which was a 5-year project,

between 2014 and 2019, was introduced with the intent to strengthen the primary and secondary school teacher professional development system (Ministry of General Education and JICA, 2015). The target group included lecturers from Colleges of Education and primary and secondary school teachers from collaborating schools. These actions were expected to raise the learners' performance at primary and secondary school levels. However, planning for instruction is an important and integral part of the complex activity of teaching but learning how to plan for instruction continues to challenge teacher educators (Zazkis *et al.*, 2009).

Although lesson planning is essential for improving learning and teaching capacity, the implementation of lesson plan in the classroom is rarely undertaken (Cullen *et al.*, 2013). Conceptual understanding of the components of a lesson plan, among other factors, is key to effective preparation and implementation of a lesson. Learners can then be guided into meaningful learning that would result in learners' high academic performance.

Furthermore, of the many acclaimed and accepted measures or practice with promise to improve teaching has been the recent years' sustained introduction, participation and engagement of teachers in Continuing Professional Development(CPD) programmes at school level, district, province and national level as a community of learners or as popularly referred to as the Professional Learning Community (PLC), which focus on important collaborative subject knowledge acquisition necessary to improve on school academic performance (Mamba, 2020). Emphasis on the importance of lesson planning has been highlighted through teacher training institutions and Continuous Profession Development (CPD) workshops organized by the Zone In-Service Training (INSET) coordinator in the Zambian setting. Teachers in zones in Lusaka district including Chibolya zone have been beneficiaries of these government interventions.

However, learners' academic performance in science in primary schools continue to be poor despite all the strategic interventions by the government to enhance lesson planning and implementation among teachers (Examination Council of Zambia, 2018). Furthermore, the Eastern Provincial Education Office (PEO) has observed that despite the various service training programmes, seminars, and workshops organized at school, zonal,

district, provincial, and national level, learners' academic performance in science has been poor (Provincial Education Office, 2019).

In summary, literature has countless evidence regarding efforts undertaken in both in-service and pre-service teachers to create lesson plans that meet the needs of the learners. Areas that have received attention include importance and purpose of a lesson plan, basics of lesson plans, and Basic principles and components of lesson planning (Adams, 2016). However, there is no research that focuses on teacher's conceptual understanding and implementation of key components of a science lesson plan. Hence, this study.

1.2 Statement of the Problem

Understanding the components of a Lesson plan can provide opportunities for teachers to plan and implement effective lessons to their students (Popham, 2013). Despite all the strategic interventions by the government to enhance lesson planning and implementation among teachers, its practice has been poor. Furthermore, very little research has been undertaken to determine teachers understanding of the components of a lesson plan. Therefore, there was need to undertake this study to determine Primary Teachers' Conceptual Understanding and Implementation of Components of a Science Lesson Plan in three selected Primary Schools in Chibolya Zone of Lusaka District.

1.3 Purpose of the study

The study sought to examine Primary Teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone of Lusaka District.

1.4 Research objectives

The specific objectives of the study were to:

- i. Explore the primary teachers' conceptual understanding of the components of a science lesson plan.
- ii. Determine what primary teachers write on the components of a science lesson plan.
- iii. Find out how primary teachers implement the written science lesson plans.

1.5 **Research questions**

The research attempted to answer the following questions:

- i. What is the conceptual understanding of primary teachers on the components of a science lesson plan?
- ii. What do primary teachers write on the components of a science lesson plan?
- iii. How do primary teachers implement written science lesson plans?

1.6 **Significance of the study**

The significance of the study comes in many forms and various groups are to benefit differently as explained below:

- **Classroom teachers** the study may generate information on conceptual understanding of the components of a science lesson plan by teachers needed by classroom teachers to uphold the need to understand and implement effective lesson plans.
- **Senior teachers, Deputy Head teachers, Head teachers and Standards Officers** may use the details of the findings of this study to mentor and advise class teachers appropriately to ensure effective teaching and learning.
- **Researchers** may use the research findings and recommendations for further in-depth research in components of a lesson plan and its implementation.

1.7 **Limitations of the study**

The study was limited to Chibolya zone for the researcher to complete the study within the time-frame of the study undertaken. The study was undertaken on the premise of an assumption that the teachers had studied lesson plan during their tertiary education and CPD activities at the Zonal level. In the same vein, further limitations were faced due to the respondents' individual characteristics and attitudes that posed a challenge to the smooth running of the data collection process.

To mitigate the limitations of this study, a number of measures were taken by the researcher. Firstly, detailed data collection instruments were used to enable respondents to give all the required information for the study without response bias. The researcher was mindful in phrasing questions in a way that the respondents could not be inclined to

take a side when responding but rather use sound judgement. Furthermore, instruments of data collection were designed in a clear, precise and simple manner to enable participants of the study to give adequate information.

1.8 **Delimitations**

The study focused on primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools of Chibolya Zone in Lusaka District. Three primary schools in Chibolya Zone were selected randomly out of the five in the Zone because they were a representative of each school. The Zone was selected because all the schools had experienced the government interventions in form of lesson planning and delivery training. Hence making the study, opportune to undertake.

1.9 **Theoretical Framework**

The study was based on the practitioner theory as applied to teachers' knowledge of the components of a lesson plan. The practitioner theory forms the basis of scholarly practice (Godwin and Meek, 2016). It also includes experimental knowledge that is driven by personal values, commitment, and ethical conduct (Rigg *et al.*, 2021). The theory expresses an ideal of professional excellence that is informed by experiential knowledge, and motivated by personal values, political commitments, and ethical conduct (Schwartz, 2015). The ideal scholar practitioner interrelates concepts, understandings, and methods from varied theoretical and practical perspectives.

Scholar practitioners reflect on and assess the impact of their work. Cabrera and Colosi (2012) add a problem-solving approach to scholarly practice. He sees the work of a scholar practitioner as learning about or recognizing problems, examining them closely, and searching for productive solutions. Stated differently, it is necessary for teacher educators and teachers to recognise and be aware of the theoretical assumptions that influence the nature of educational theory and practice in teacher education in order to ascertain the impact of these assumptions on the theory and practice of teaching in the classroom.

Such an awareness instills in teacher educators and teachers a critical astuteness that could be concerned with determining the most effective, relevant and best, practice in the classroom, while at the same time ensuring that education practice is not directed by ideological and political concerns but rather by educational principles (Summers, 2018). This theory was relevant to the study in that it interrelates concepts, understandings, and methods from varied theoretical and practical perspectives that are pre-requisite to the conceptual understanding and implementation of the components of a lesson plan. This theory allowed the researcher to examine the teachers' conceptual understanding and implementation of the components of a Science Lesson Plan.

1.10 Conceptual Framework

This present study employed the conceptual framework presented below as shown in Figure 1. Conceptual Knowledge of the components of a lesson plan is the Independent Variable (IV) while the implementation of the lesson is the Dependent Variable (DV).

Components of a Lesson Plan

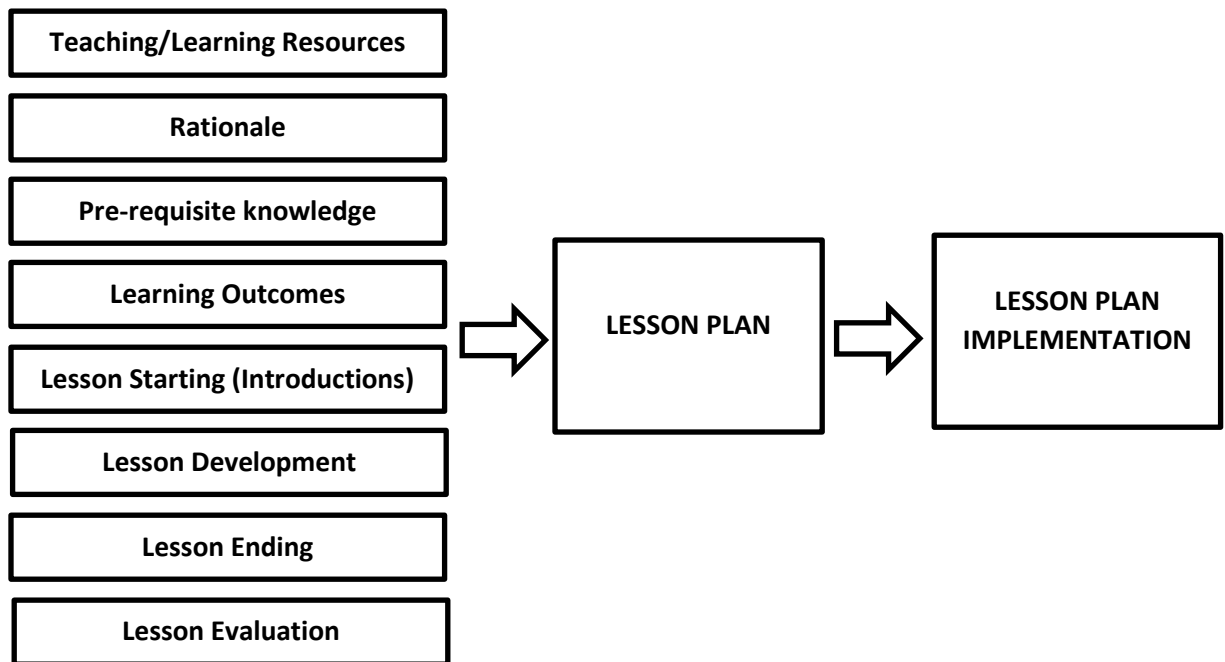


Figure 1: *Conceptual Framework*

In this study a teacher is expected to possess conceptual understanding of the components of a lesson plan and be able to implement the components in a lesson. Therefore a teacher is expected to deliver an effective lesson if he or she has a sound conceptual understanding of the components of a science lesson plan. Consequently, a teacher who is able to uphold good practices in lesson planning by ensuring that the various components of a lesson plan are engaged effectively, is likely to affect significant success in lesson delivery.

1.11 Operational definition of terms

Conceptual Understanding	Refers to an integrated and functional grasp of ideas.
Execution	Refers to the process of putting someone to death, or the way a plan is conducted.
Implementation	Refers to the realization of an application, or execution of a plan, idea, model, design, specification, standard, algorithm, or policy.
Lesson Plan:	Refers to a teacher's daily guide for what students need to learn, how it will be taught, and how learning will be measured. Lesson plans help teachers be more effective in the classroom by providing a detailed outline to follow each class period.
Science Teacher	A science teacher educates students on the core concepts of the scientific method and scientific principles.

1.12 Chapter Summary

This chapter presented the background of the study, the statement of the problem and the purpose of the study. It also presented the objectives of the study and the associated research questions that the study will intend to give answers to. Lastly, it explained the significance of the study, theoretical and conceptual frameworks as well as definitions of the terms used in the study. This study, in brief, was aimed at determining the primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone of Lusaka District. The following chapter reviews the literature relevant to the topic under study.

CHAPTER TWO: LITERATURE REVIEW

2.0 Overview

This chapter focuses on the review of literature related to this study. The literature reviewed in this study can be contextualized as global, African and Zambian studies. In view of primary teachers' conceptual understanding and implementation of the components of a lesson plan, this review focuses on the historical overview of the study area, lesson planning, basic principles of lesson planning, the importance of lesson planning, the basic features of lesson planning, provides a critique of the literature to identify the knowledge gap.

2.1 Lesson Planning

Lesson planning is an important and integral part of the complex activity of teaching (Dagher and BouJaoude, 2011). The success of delivering any lesson depends on the process of planning to teach that is undertaken by every teacher (Sural, 2019). In educational institutions, teachers need to be aware that they are legally obligated to fulfil lesson preparation procedures (Sural, 2019). Since education is a progressive work that needs to be addressed in a rigorous and systematic manner, the lesson plan is often arrived at through a variety of processes (Adam, 2014). Teachers are therefore implored to pay considerable attention to lesson planning and lesson preparation in order to achieve an efficient and effective teaching process (Fink, 2005).

2.1.1 Basic Principles of Lesson Planning

As with any skill, lesson planning becomes easier over time. As teachers gain experience in the classroom, they learn certain principles about planning. When seasoned teachers are asked to list some basic principles of lesson planning that novice teachers should be aware of, the ones that are frequently mentioned are actually basic principles of good teaching which are coherence, variety, and flexibility. These principles have proven useful for all teachers (Jensen, 2014). A well-developed lesson plan reflects the interests and needs of students. It incorporates best practices for the educational field. The lesson plan

correlates with the teacher's philosophy of education, which is what the teacher feels is the purpose of educating the students (Salsbury *et al.*, 2008).

Lesson preparation is worth the time, because written plans force teachers to carefully think on how to reach the outcome to ensure learner achievement (Yildirim, 2003). Matimolane and Sanders (2004) contend that there are concerns that the planning of many teachers may be inadequate, which could be a factor inhibiting some teachers from meeting planning requirements such as designing lessons around outcomes; using learner-centred and activity-based approaches that involve the development of skills; and including continuous assessment which contributes to the learning process. Furthermore, it could be perhaps the said teachers do not understand the concept of a lesson plan and its various components (Matimolane and Sanders, 2004).

According to Jahjough (2014), planning is a psychological process of envisioning the future, and considering goals and ways of achieving them. Lesson planning can be defined as a systematic development of instructional requirements, arrangement, conditions, materials and activities, as well as testing and evaluation of teaching and learning. It involves analysis of the learning needs and the development of a delivery structure to meet those needs. Planning a lesson involves teachers' purposeful efforts in developing a coherent system of activities that facilitates the evolution of learners' cognitive structures. The quality of those decisions and efforts depends on the creativity of teachers and on their ability to apply learning and instructional theories.

2.1.2 Importance of the Lesson Plan

Deciding what to teach, in what order, and for how much time are the basic components of planning (Jensen, 2014). The lesson plan serves as a map or checklist that guides us in knowing what we want to do next; these sequences of activities remind us of the goals and objectives of our lessons for our students. Without such a guide in a classroom, a teacher is more likely to lose direction or may teach outside of the scope of the lesson. Jensen (2014) adds that a lesson plan is also a record of what we did in class; this record serves as a valuable resource when planning assessment measures such as quizzes, midterms, and final exams. The preparation of assessments is centred on what learners have learnt. According to John (2006), lesson plan is there to help the teacher with

revisions, planning for assessments and reteach the lessons that have a negative evaluation. A record of previously taught lessons is also useful when we teach the same course again, so that we have an account of what we did the term or year before to avoid reinventing the wheel (Cuñado and Abocejo, 2018).

When we have to miss class, a lesson plan is a necessity for the substitute teacher, who is expected to step in and teach what had been planned for the day (Jensen, 2014). In addition, just as teachers expect their students to come to class prepared to learn, students come to class expecting their teachers to be prepared to teach. A lesson plan is part of that preparation. Efficient lesson delivery becomes a resulting product of a well-designed lesson plan that meets the needs of the learners (John, 2006). A well-executed lesson plan brings about competent teachers who become effective and efficient educators (Cuñado and Abocejo, 2018).

Jensen (2014) posits that an important component of effective teaching is having a plan for each class session for each subject taught that maximizes the potential for every student to achieve the objectives sought. Creating these plans will take time, but it will be time well spent. A common adage says, “A failure to plan is planning to fail.” Adams (2016) asserts that lesson plans enable teachers to make certain state standards implemented in the lesson. What one takes time to plan for, is easy to implement. Approaches and methods, when to present the teaching aid, what questions to ask, expected answers. All these are possible to be implemented if the lesson has been well planned for. She further adds that it will be easy for a teacher to teach with a focus on the goals and objectives of the lesson, state measurable objectives that specify what students should know and be able to do at the end of the class.

Planning is also meant to devise a relevant, interesting, effective way to get students’ attention on the topic at the beginning of the lesson. Anticipatory sets are an excellent way to capture the attention of students (Adams, 2016). Jensen (2014) adds that planning helps the teacher to organize the information that will be presented in a well-defined order to necessitate knowledge acquisition by the learners, to identify and devise appropriate instructional strategies, to determine the resources and materials needed, including visual and other aids, determine appropriate procedures to check for student understanding,

formative assessment, and to also plan a realistic timeline for the lesson. Additionally, planning for lessons helps to provide documentation to principals and other administrators of the content taught and the teaching procedures used (Adams, 2016).

Planning to teach and learn is cardinal for any teacher to be effective in class. Historically, there has been abundant evidence that teacher effectiveness raises student achievement (Borman and Kimbal, 2005). Effective teachers do contribute to the academic formation of students. However, Yildirim (2003) found that some teachers complained that the curriculum does not guide them enough, hence switching from a content-based teaching approach to an outcomes-based one is still a struggle for many. It is clear that the changes which are required to conceptualize teaching as an interactive activity in which both the teacher and the learner participate in the teaching and learning process are not adequately described in curriculum documents (Nakabugo and Siebörger, 2001). Setting old and new practices in opposition to each other also obscures the reality that there is a gradual movement from one towards the other, which might be facilitated at times by new insights and perceptions. If planning methods are to make the desired impact in classrooms across the country, much closer attention will have to be paid to what happens in the classrooms and finding out how teachers conceptualize the components of the lesson plan.

2.1.3 Basic Features of Lesson planning

Lederman and Niess (2000) argue that as to whether a written plan increases the teacher's effectiveness any more than a plan committed to memory does not compromise the value of planning. Whatever approach is taken, the research evidence points to the fact that the end-product, the lesson plan, is often arrived at through a variety of processes (John, 2006: 8). However, only few teachers seem to be doing adequate planning to achieve these benefits. Shavelson and Stern (1981), the key elements that necessitates the importance of planning include: using effective methods of teaching to maintain learner attention, an orderly transition between activities in positive teaching and learning environments and dealing with the growing instructional diversity within the classroom in order to achieve goals. In their lesson planning teachers should include most of these factors.

Lovat and Smith (2003) maintain that planning for a lesson demands much more than merely the preparation of textbook content. Instead, planning lessons involve a complex

and interrelated chain of events and decisions about learning activities (Robinson, 2015). In the planning process the teacher simultaneously identifies the following: learning outcomes and assessment standards or mastery level; the theme and purpose of the lesson; learners' prior knowledge; references; methods of instruction or teaching strategies; appropriate materials and resources needed; key concepts; learners' activities; actual assessment tasks and techniques; expectations and criteria for judging the effectiveness of planning. Spady (1994) adds that one of the challenges of outcomes-based education is not only to integrate content-knowledge and development of conceptual understanding into the outcomes, but to find ways of choosing content knowledge. This indicates how multifaceted planning is, and therefore requires knowledge of all the interrelated components.

Learning outcomes are written statements of what the successful learner is expected to be able to achieve at the end of the lesson unit or qualification (Adams, 2006). Learning outcomes are statements of what a learner is expected to know, understand and be able to demonstrate after completion of a process of learning. Learning outcomes are indicators of success of an academic programme. Learning outcomes give a clear idea of what can be achieved by joining a particular programme. Whether it is a short course or a degree programme, the learning outcomes should be listed and written down before the start of the course to know and to check whether the course is designed and conducted perfectly. Based on the identified learning outcomes, teaching context, learning activities and assessment scheme have to be properly designed to successfully conduct and complete the programme (Adams, 2006). Learning outcomes describe what learners are able to demonstrate in terms of knowledge, skills, and values upon completion of a course, a span of several courses, or a program. Clear articulation of learning outcomes serves as the foundation to evaluating the effectiveness of the teaching and learning process.

Teaching aids are an integral part in the teaching-learning process. They are determined by the other lesson components and the learning conditions. Teaching aids have a great role to play in the communicative approach. Teaching aids are also called audio-visual aids. Contemporary teaching aids that are in use provide stimulation to ears and eyes together compared to the traditionally used teaching aids that stimulated only one sense organ. The emerging teaching aids involve other sense organs (Durdanović, 2015).

Durdanović (2015), Mambwe (2020), and Mambwe *et al.*, (2019) identifies that the activity and method of teaching and learning includes input factors teachers, facilities, instructional materials, students, and curriculum. These input factors are combined in the process of teaching, administration, research, quality assurance, and community impact. The output shows the skilled and employable graduates, new knowledge created, responsible citizens and economic growth.

Teaching and learning activity are seen in the skills, attitudes and research orientation of the students. In devising the most effective way by which knowledge content can be delivered, learners are taught technical skills, exposed to career awareness about the labour market, equipped to have an intelligent understanding of technology and stimulate creative thinking. Teachers are great facilitators of knowledge and skills in the 21st century teaching and learning profession (Mambwe 2020; Mambwe *et al.*, 2019 and Joseph, 2015). Teachers use teaching aids to enhance classroom instruction, attract learners' attention and create a motivation to learn. These teaching aids are devices, instructional aids, or objects that help the teacher to effortlessly carry out the teaching-learning process. A lot depends on the creative abilities of the teacher. The use of teaching aids can facilitate the learning process by making it interesting and less time consuming. The use of teaching aids enables learners to use their hearing or seeing abilities and actively perform something while learning (Okwori, 2011).

In a lesson plan, the rationale states the main learning goal for students. It is an essential part of constructivist lesson plans (Jansen and Van Der Merwe, 2015). In addition to stating the rationale for the lesson plan, teachers must also outline the lesson outcomes. Lesson Plan Rationales are an essential element of a lesson plan that simply explain why a lesson has value to students. Learning is constructed on prior knowledge. The more we understand about what students already think, and the more we help them engage their prior understandings, the more likely they are to learn well and the less likely they are to misinterpret the material in our courses. Since prerequisite knowledge varies by student, we can be misled about what they understand when we rely on class discussion to hear their ideas.

On the global scale, the process of lesson planning takes various forms depending on the models of lesson plan implementation. A study undertaken by Sanchez and Valcárcel (1999) in Spain revealed that most teachers begin by thinking of the content to be taught, even if some do so indirectly by way of their objectives, and then choose activities such as problems and exercises. For this, the students' textbook is the principal reference, although most also consult other books either because they do not totally agree with the textbook or because they want more information (Jansen and Van Der Merwe, 2015). During this process, they draw up written documents usually for their own and students' use.

Literature also shows that lesson planning has undergone a transformation since the development of the lesson study approach to planning. A study done by Kanellopoulou and Darra (2018) on planning of teaching in the context of lesson study revealed that participating teachers were positively influenced by the detailed planning and preparation of the research lesson, gaining useful experience and valuable knowledge on lesson preparation during the implementation of the Lesson Study phases.

A study done by John (2006) on lesson planning and the student teacher outlines the steps taken to plan to teach and learn. The first step involves the selection of the topic or component of the subject to be taught. This subject-matter source, along with the age and ability range of the pupils, are the major factors in the early consideration of appropriate aims and objectives. The second step focuses on the exemplification of aims and objectives, both of which should be linked to wider curriculum considerations. During this step, more precise learning objectives or goals are specified as pupil learning is operationalized into these objectives, which are often drawn from a combination of cognitive and affective domains. The third step involves the preparation of the content to be covered and a consideration of the teaching methods and learning experiences that will best bring about the accomplishment of the set aims and objectives. These usually amalgamate into activities or tasks based on the types of methods adopted. In the fourth step, an assessment process is planned so that the efficacy of the teaching methods and activities can be gauged against the set objectives.

However, just because a lesson plan has been scrupulously filled in does not mean pupils will learn optimally. Borich (2000) argues that there are three ‘classic traps’ of lesson planning; the first is activity-focused planning: when teachers find a ‘good’ activity and then reverse engineer the lesson objectives to match the likely outcomes of the activity. The second is coverage-focused planning: this begins with someone else’s learning objectives rather than considering pupils’ needs. It can mean an exercise in getting through the curriculum or aiming towards an assessment. The third is over-planning: too many activities or too many objectives. Failure to break down the objective and trying to cover too much (Higgins *et al.*, 2015). This is ineffective planning which comes as a result of teachers’ failure to conceptualize the importance and implementation of a lesson plan. Higgins *et al.* (2015) assert that teachers need to recognize that they mostly talk about teaching and instead they need to learn how to discuss student learning. Higgins *et al.* (2015) summarizes the four critical parts of effective planning, based on what the evidence says: the first is prior achievement: the levels of knowledge on the topic for the pupils at the start of the lesson. The second is targeted learning: the desired levels at the end of the lesson. The third is progression: the rate of progress from the start to the end of the lesson and finally the fourth being teacher collaboration with the learning during the learning process (Higgins *et al.*, 2015). This leads to effective planning that stems from teachers’ conceptual understanding of the importance and implementation of the lesson plan.

A preceding study about difficulties in designing lesson plan based on 2013 Curriculum was undertaken in Indonesia by Farid (2014). It is a qualitative research entitled “Teachers Difficulties in Lesson Planning Based On School-Based Curriculum”. Its objectives to picture the teachers’ preparation before conducting a lesson in terms of designing learning activities to conduct in classroom, particularly in setting indicators and objectives, selecting materials and media, plotting the teaching procedures, conducting students’ evaluation and to investigate the difficulties faced by the teachers in planning lesson. He gathers data through non directive interviews and document analysis using several categories in Reiser and Dick’s about Systematic Planning. The result of this research is that the teachers have got the difficulties in finding suitable materials for the students due to the lack of resource books for vocational school. The study is relevant to the present

study in that it brings out the aspect of lesson planning in relation to the curriculum. However, the gap in the study is that it does not focus on teachers' understanding and implementation of the written lesson plans in the classrooms.

If a teacher begins with a well-defined targets of intended outcomes, authentic assessments can be rightfully achieved, reflective of what they teach and what learning they could expect from their students (Stiggins, 2008). According to Jahjough (2014), well set objectives lead to well-designed assessments; reflecting lessons taught. Successful outcomes will then follow when teachers are able to make a clear learning objective towards smooth delivery of the entire lesson (Department of Education and Training, 2017). However, some research findings divulged that pre-service teachers could hardly make clear learning objectives, where their lessons could not produce the desired results once they mismatch assessment with the learning objectives (Rodriguez and Abocejo, 2018).

Some pre-service teachers often struggle how to do the introduction when they do lesson transition and how to motivate their students towards the lesson proper (Evans, 2012). If a pre-service teacher finds it difficult to begin a lesson, then several minute activities may be shifted to extended anticipatory or exploratory lesson phase (Flynn *et al.*, 2004). Jones *et al.* (2011) reported that this may require set of activities just to bring about learners' attention. Eliciting prior knowledge helps students accomplish basic understanding needed during the lesson planning (Jones *et al.*, 2011). Lack of genuineness and understanding in prepared lessons lead to failure to fully engage students during lessons (Zulu, 2016). Pre-service teachers often lack authenticity of their prepared lessons and cannot fully engage their students which can be better offset if they consider recalling facts than focusing conceptual meaning (Rodriguez and Abocejo, 2018). A large proportion of students' works are merely note-taking than synthesis or application of ideas (Jones *et al.*, 2011).

2.1.4 **Zambian Perspective**

National governments and other stakeholders in education have formulated policies that uphold lesson planning as an integral part of the wheels to achieve quality teaching and learning (Robinson, 2015). For instance, since 2004, the Government of the republic of

Zambia has worked with Japan International Cooperation Agency (JICA) to integrate lesson study, into the Zambian teacher development programmes as a way of improving primary and secondary mathematics and science instruction. Lesson study is a mechanism in which teachers collaboratively plan a lesson on an identified topic, observe the lesson, discuss how to improve the lesson and re-teach the lesson (JICA, 2015). Lesson study aims at improving teacher's skills in planning and delivering of lessons. In addition, lesson study activities have been found to be significant at the National Science Centre which is the Centre under control of the Minister of Education and engaged in acting as a hub for bringing in-service and pre-service teacher education through training of science and mathematics teachers, development of teaching and learning materials, and research (JICA, 2015).

According to Ishida (2019), further interventions include the Strengthen Mathematics, Science and Technology Education (SMASTE) project which was initiated by the Ministry of Education in collaboration with JICA, which came after review of the existing programmes in 2005. In the same vein, the project for Improvement of Pedagogical Content Knowledge (IPeCK) which was a five-year project, between 2014 and 2019, was introduced with the intent to strengthen the teacher professional development system with an improved understanding of lesson study. Also, the now developed sector wide, medium-term program called the Zambia Education Enhancement Programme (ZEEP) seeks to help the Ministry of General Education (MoGE) to achieve sector priorities and contribute to the Seventh National Development Plan (7NDP) objectives on human development (Ministry of General Education and JICA, 2015).

Another study undertaken by Zulu (2016) on the attitude of teachers towards lesson planning from a classroom management perspective in selected public schools of Kitwe District showed that the majority of participants had favourable attitudes towards teaching through lesson plans. However, what was discovered was that those teachers who favoured lesson planning found heavy workload as a major obstacle in doing so. On the other hand, some teachers felt that lesson planning was only time consuming and often dismissed as a bother and irrelevant. Despite the importance of the lesson plan, in practice, its implementation in the classroom is rare. The study explored that attitudes of teachers

towards lesson planning but was silent on their understanding of the component of the lesson plan and its implementation to that effect.

Another study undertaken by Mumba (2019) sought to assess whether preparation of lessons by evening class teachers contributed to the academic performance of students in evening classes at Fibobe Primary School in Ndola, Zambia. The study was guided by the New Sociology of Education and the Constructivism theories. The study was a case study design and it employed qualitative approach to collect data. A sample size comprised 35 respondents that were disaggregated as follows; the coordinator, the head teacher, Education Standards Officer (ESO), 12 teachers who did not teach evening classes, 12 pupils in FGDs, 6 evening class teachers and 2 senior teachers, all selected through purposive sampling. Convenience sampling was used to select the school. Interview guide, Focus Group Discussion guide, observation checklist and document review were used in the collection of data. Data collected was analysed using thematic analysis. This involved coding of the data to generate the emerging themes. In order to strengthen data analysis, descriptive statistics was used by using percentages and frequency tables.

The major findings of the study revealed that evening class teachers did not prepare lessons in advance for teaching evening class students at Fibobe Primary School. It was also evident from the findings that lack of lesson preparation contributed significantly to poor academic performance of evening class students. Teachers did not prepare lesson plans, schemes of work and were using mostly one teaching method. The findings further revealed that lack of lesson preparation was exacerbated by lack of monitoring of teachers' lesson preparation. Though there were other factors such as absenteeism, lack of concentration by students due to fatigue and poor academic background of students, it was, however, concluded that the major contributing factor to poor academic performance of evening class students was lack of lesson preparation by evening class teachers. The study is relevant for review by the researcher in that it brings out preparations of lessons which includes lesson planning. However, the main focus of the research was on the effect of lesson preparation on students' academic performance and not the understanding and implementation of the lesson plan in a classroom.

Notwithstanding various interventions to enhance lesson planning, teachers' understanding, and delivery of learner-centred pedagogy is still relatively superficial, while evaluations found that the lesson study practice improved teachers' lesson planning and students' performance on exams (Lingambe *et al.*, 2014). This study examined the primary teachers' conceptual understanding and implementation of components of a Science Lesson Plan in three selected primary schools in Chibolya Zone in Lusaka District.

2.2 Critique of the literature

Despite the importance of the lesson plan, in practice, its implementation in the classroom is a worrisome occurrence (Artaya, 2018). It is not well done. A number of studies have been undertaken on lesson planning and its importance, but little or no study has been undertaken to determine primary teachers' conceptual understanding and implementation of components of a Science Lesson Plan, thus, the undertaking of this study.

2.3 Chapter Summary

This chapter reviewed literature related to the primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan. Much study has been undertaken as regards the aspects stated, but there is still a slag in performance of the learners. Interventions have been undertaken, but the performance is still low. Perhaps it is because teachers plan, but they do not understand the underlying concept of the key components of a lesson plan and how to implement them. The next chapter discusses the research methodology and techniques used in undertaking the study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Overview

This chapter presents the methodology that was used in the study. It describes the research design that was employed, target population, sample size, sampling procedures and research instruments. It also describes the procedure for data collection, data analysis, validity and reliability, and ethical considerations. It also describes the ethical issues that were considered during data collection.

3.1 Research Design

The study employed a cross-sectional research design with a mixed approach. Cross-sectional survey design is believed to be most suitable since there are no real experiments carried out with human beings who are the study subjects in this case. The design suitability is also seen in the fact that it involved taking a sample of elements from a population of interest which is measured at a single point in time. The primary teachers in this study were assumed to have learnt about lesson planning either in the training institution attended or CPD programs in the Zone. Therefore, they were expected to possess the conceptual understanding of the components of a science lesson plan and implement them effectively. This type of research allows for a variety of methods to recruit participants, collect data, and utilize various methods of instrumentation (Hewson *et al.*, 2015). For this study, mixed research method suggests the researchers to use more than one research methods or techniques for better investigation. In this study, certain research questions were best addressed using qualitative analysis while others using a quantitative method. Therefore, the mixed method of inquiry was the best-suited method for addressing the research aims of this study.

3.2 Study sites

The study sites were the three selected primary schools of Chibolya Zone in Lusaka District. The three primary schools were given pseudo names as A, B and C. These schools were chosen to participate in the study because they do host and participate in matters of PLCs at school, district, province and national level. Further, the researcher's choice was

supported by the fact that some teachers in these schools constitute members of executive committees in various subjects at district, province and national level with a lot of experience at hosting teachers' CPDs with more frequency in Lusaka District.

3.3 Population

The study population consisted of primary teachers in the three (3) primary Schools in Chibolya Zone in Lusaka District. The total population of possible respondents was forty-two (42) as per human resource registers in the three primary schools in Chibolya Zone.

3.4 Study Sample

According to De Vos *et al.* (2011: 194), a sample comprises of elements of the population considered for actual inclusion in the study, or a subset of measurements drawn purposively from a population in which researchers are interested. Sample size design is the technique of electing the number of observations to include in a sample. The sample size is an important feature of any study or investigation in which the aim is to make inferences about the population from a sample. An important consideration in sample design is the choice of sample size. With this view in mind, the study sample consisted of thirty (30) primary teachers from the three selected primary schools in Chibolya Zone in Lusaka District. Each of the three (3) schools provided an average of ten (10) participating teachers.

3.5 Sampling Techniques

The study employed simple random and purposive sampling techniques. The three schools were selected randomly from the five schools in Chibolya zone. The main purpose of simple random sampling was to obtain a representative sample of a population. A representative sample is one that accurately reflects the characteristics of the entire population, such as its demographics, behaviors, opinions, or attitudes. Purposive sampling is a technique used to select a specific group of individuals or units for analysis (Creswell, 2008). Participants are chosen "on purpose," not randomly. It is also known as judgmental sampling or selective sampling. In this research, Teachers were purposively sampled based on the number of years of teaching science. Most of them had taught

science for at least three years. Therefore, purposive sampling was done with reference to the staff register in the respective schools based on number of years of teaching science.

3.6 Data Collection Instruments

The research instruments that were used in this study are the questionnaire, observation schedule and document analysis schedule. A combination of the data collection instruments enabled study to conceptually and analytically integrate quantitative and qualitative data needed to achieve the research objectives. The data collection instruments were developed in line with the research questions. All participants were required to answer specific questions related to the topic of study, make a lesson plan so as to be checked to see what they write and to teach so as to be observed. Due to the descriptive nature of the study, the questionnaire was very instrumental in examining the responses of the participants on primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone in Lusaka District. A survey instrument such as questionnaire was designed in a way that meaningful results could be achieved by way of collecting both quantitative and qualitative data from the 30 selected participants the participants of the study in the selected primary schools of Chibolya Zone in Lusaka District. The checking of a lesson plan, which constituted document analysis, was aimed at seeing what teachers write on each component of a science lesson plan. In the same vein, the observations were aimed at having a true picture of the situation at the scene and obtain data that may have not been obtained through other corresponding instruments.

3.6.1 Questionnaire

The questionnaire was used to collect personal information and the conceptual understanding and implementation of the components of a science lesson plan from all the participants of the study. Open and closed ended questions were designed in order to solicit data from the participants. The main advantage and reason why the researcher opted for this tool was that large amounts of information can be gathered with relative ease. . This research used a paper-based questionnaire that was self-administered with help from the researcher where needed. The study did not employ online questionnaire platforms as widely used in most of the current studies. This ensured that even participants

who have no access to the internet or those who may not know how to use online platforms were all included in the survey. An initial draft of the questionnaire was designed by the researcher, and then validated. Content validation of the questionnaire was done by administering the questionnaire to at least 15 teachers at the selected primary schools which were not included in the main study, in a pilot study. This ensured that the responses from the pilot study are not included in the analysed data but only used for the purpose of improving the quality of the questionnaire.

In part 1, participants were asked to provide the following demographic information: Gender, age range and highest level of education. In part 2, the participants were asked to respond to items on 5-point Likert scale on their understanding and implementation of the following 10 components of a lesson plan: *preliminary details, specific learning outcomes, references, teaching and learning materials, rationale, pre-requisite knowledge, start of the lesson, lesson development and progression, ending the lesson, and lesson evaluation*. The participants were asked to mark each of the 10 concepts as; “I do not understand it and I do not implement it,” “I understand it but, I do not implement it,” “I do not understand it but, I implement it,” “I partly understand it and I partly implement it,” and “I understand it and I implement it.” In part 3, a conceptual knowledge test was used to collect qualitative data. In this section, participants of the study were asked to explain each of the 10 components of a science lesson plan.

3.6.2 Document analysis schedule

The document analysis schedule (refer to Appendix 3 on page 63), was designed to rate how teachers wrote the components of the lesson plan. On a 5-point scale of 0 to 4, the researcher evaluated the contents of the lesson plans on the following components, *preliminary details, specific learning outcomes, references, teaching and learning materials, rationale, pre-requisite knowledge, start of the lesson, lesson development and progression, ending the lesson, and lesson evaluation*. Document analysis is a systematic procedure for reviewing or evaluating documents both printed and electronic material. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge (Bowen, 2009).

3.6.3 Observation schedule

In this study, an observation schedule (refer to Appendix 3 on page 67) was used to observe and rate the participants of the study on the implementation of the components of a lesson plan. The following components were observed and rated during science lesson delivery: start of the lesson, learning activities, utilization of teaching and learning materials, teaching strategies, and ending of the lesson. These components were observed and rated on a 5-point scale of 0 to 4. Observation, as the name implies, is a way of collecting data through observing.

3.7 Data Collection Procedure

In this study, data was obtained from the research respondents by use of a questionnaire that collected both quantitative and qualitative data, observation schedule for the lesson delivery and document analysis schedule to check on the way teachers wrote the components of a lesson plan. The instruments were administered within a period of two weeks in all the three schools. The first instrument to be administered was the questionnaire. The questionnaire collected both qualitative and quantitative information. Thirty teachers responded to the questionnaire. The second instrument to be used was the document analysis schedule. During the teaching of science, document analysis schedule was used to evaluate the contents of the lesson plans produced by the participating primary teachers. The third instrument, an observation schedule was used to examine primary teachers' implementation of the written lesson plan by observing all the thirty science lessons conducted by the respondents.

3.8 Data Analysis Procedures

SPSS was used to generate descriptive statistical information in the form of frequencies, tables, charts and graphs. Participants' responses to items in the questionnaire were recorded according to the assigned scores. For example, "I do not understand it and I do not implement it" was assigned a score of 1, "I understand it but, I do not implement it" was assigned a score of 2, "I do not understand it but, I implement it" was assigned a score of 3, "I partly understand it and I partly implement it" was assigned a score of 4 and "I understand it and I implement it was assigned a score of 5. The frequencies of responses under each component were computed and compared to examine primary teachers'

understanding and implementation of the components of a science lesson plan by using the modes.

For qualitative data, primary teachers' conceptual knowledge was examined in which participants were asked to define, explain or describe the 10 components of the lesson plan. The responses were scored by matching participants' responses with the standard definitions, explanations, and descriptions of the concepts as adopted from the ZEEP instrument. Categories were formed thematically, by checking the majority of responses. With regards to the contents of the written lesson plan, a document analysis schedule was used where lesson plans were scored and assigned a score. Scores ranging from 0 to 4 were scored and modes were computed and compared among participants. Then the mode was used to determine the prevailing status quo. Lastly, an observation schedule, with scores of 0 to 4, was used where the implementation of the written lesson plans was assessed and assigned scores. Frequencies for each observed item were computed and compared among participants of the study. The mode at the bottom was computed for each component. The ratings revealed where the teachers belonged.

3.9 Validity and reliability

To ensure validity and reliability, the research questions were clearly and logically framed, data collection methods and instruments were carefully chosen, data was collected from a representative and adequate sample size according to the research design used, data was analysed using appropriate descriptive statistical techniques, results were accurately and transparently interpreted and reported, and limitations and implications were addressed. Furthermore, data collection tools were validated by member check (the research supervisor and a team of experts).

3.10 Ethical Consideration

The researcher sought ethical clearance before conducting the study. During the research, participants' responses were neither interfered with nor contested against by the researcher. The collection of data was done procedurally by first seeking permission from school head teachers to visit the schools under study. In this study, the measures undertaken to ensure compliance with ethical issues included keeping the identity of participants' confidentiality by assuring them that their names would not be included

in the study. Lastly, all the participants received equal treatment regardless of their social status.

3.11 **Chapter Summary**

This chapter has explained the methodological design used in this study. A mixed approach was used for the researcher to interact with the participants of the study who are the holders of the information needed to carry out a conclusive study on primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone of Lusaka District. With a study sample of thirty (30), the study employed the use a questionnaire with both closed and open-ended items, observation schedule and document analysis schedule to collect data. Both quantitative and qualitative data were collected and analysed accordingly. Quantitative data was analysed using descriptive statistics because the study was a survey and it was not interested in any significant tests. Qualitative data was analysed using themes to come up with broad categories.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.0 Overview

This chapter presents the findings of the study on primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone in Lusaka District. The findings presented in the study were framed according to the research questions, and based on the responses to the questionnaire as well as data obtained through observation schedules and document analysis schedule of the lesson plans.

4.1 Characteristics of respondents

This section presents the characteristics of the key respondents in the study. The information include sex, age, levels of education and years of teaching experience.

a. Sex

Table shows the distribution of respondents by sex.

Table 1. Distribution of respondents by sex

School	Male	Female
A	4	5
B	7	3
C	5	6
Total	16	14

The Table 1 shows that out of the total of 30 respondents, 16 were male and 14 were female. Therefore, in terms of gender, there was a relatively fair representation of the respondents.

b. Age

The figure 2 shows the distribution of respondents of the study according to their age brackets:

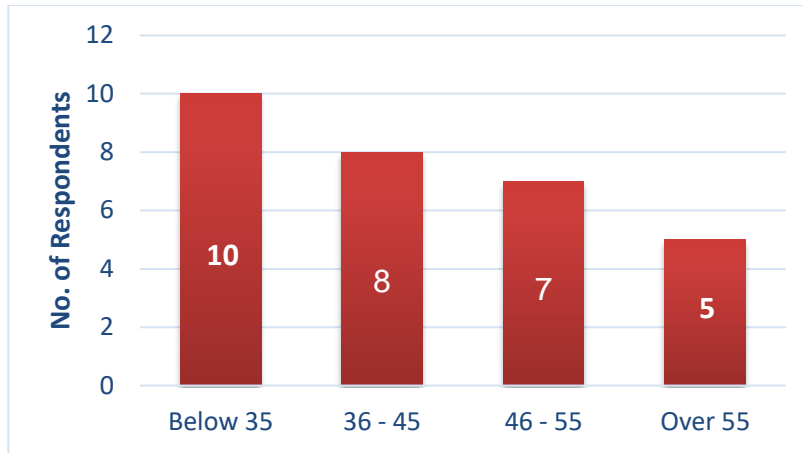


Figure 2 Respondents’ age brackets

Figure 2 shows the age distribution of respondents. The majority of respondents 10 out of 30 were of ages below 35 years while another 8 of the respondents were between 36 and 45 years. Furthermore, 7 respondents were between the ages of 46 to 55 years while 5 were over 55 years old.

c. Highest Level of Education

The figure 3 shows the distribution of respondents of the study according to their highest level of education:

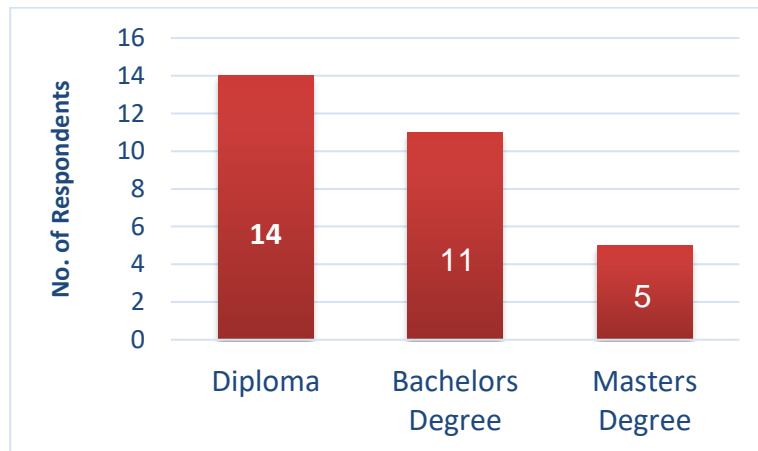


Figure 3. Respondents’ highest level of education

Figure 3 revealed that the majority of the respondents, 14 out of 30, were categorized as having attained diploma level of education. Likewise, 11 were categorized as having

attained degree of bachelor level of education while 5 of the respondents had attained master's degree level of education.

d. Years of teaching experience

The figure 4 shows the distribution of respondents of the study according to their years of teaching experience.

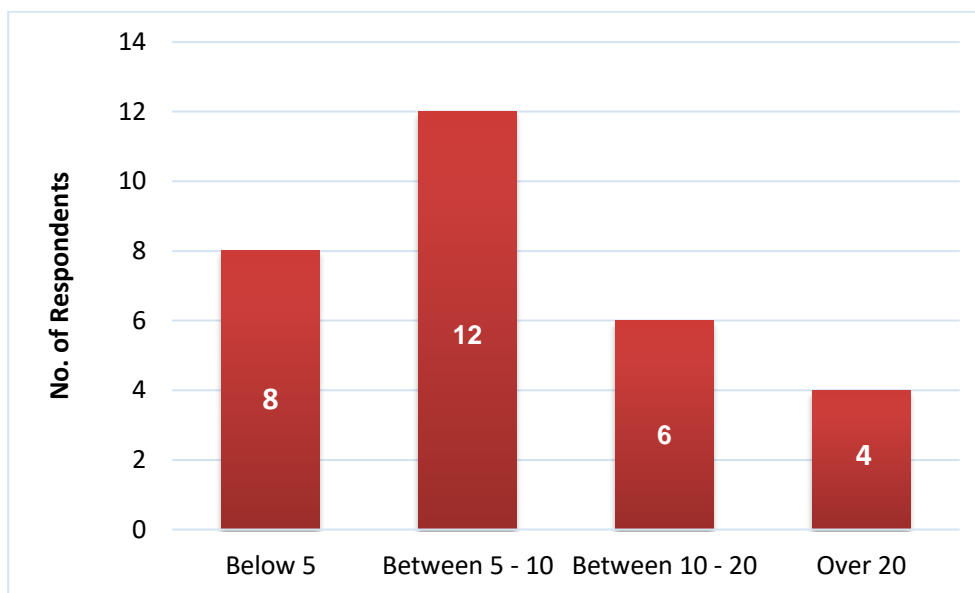


Figure 4. Respondents' years of teaching experience

Figure 4 revealed that the majority of the respondents, 8 out of 30, had a teaching experience of below 5 years. In the same vein, 12 out of 30 had a teaching experience of between 5 to 10 years while 6 out of 30 has between 10 to 20 years. Likewise, 4 out of 30 had teaching experience of over 20 years.

In this study, the demographic information provides data regarding research participants and was necessary for the determination of whether the individuals in the study are a representative sample of the target population for generalization purposes. For coding, TA, TB and TC represent teacher respondents from Schools A, B and C respectively.

4.2 Primary teachers' conceptual understanding of the components of a science lesson plan

In part 2 of the questionnaire, components of a lesson plan namely Preliminary Details, Specific Learning Outcomes, References, Teaching and Learning Materials, Rationale,

Pre-requisite Knowledge, Start of the Lesson, Lesson Development and Progression, Ending the Lesson and Lesson Evaluation were used as components of the lesson plan to be rated. The researcher used a five-point scale with; 1= I do not understand it and I do not implement it; 2 = I understand it but, I do not implement it; 3 = I do not understand it but, I implement it; 4 = I partly understand it and I partly implement it; 5 = I understand it and I implement it. The results were as follows:

Table 2. Teachers’ mode values of their conceptual understanding and implementation of the performance areas of a science lesson plan

Performance Area	1	2	3	4	5
Preliminary Details	5	9	9	2	5
Specific Learning Outcomes	6	10	7	1	6
References	9	11	6	4	0
Teaching and Learning Materials	3	2	5	9	11
Rationale	4	15	4	5	2
Pre-requisite Knowledge	8	9	6	1	5
Start of the Lesson	6	8	7	4	5
Lesson Development /Progression	7	6	10	5	2
Ending the Lesson	0	2	0	12	16
Lesson Evaluation	6	9	7	5	3
MODES	54	81	61	48	55

Table 2 shows that the teachers had a conceptual understanding of the components of a science lesson plan, but did not implement them. Specifically, the highest accumulative mode of 81 in teacher responses indicated that they understood the components of a lesson plan but did not implement them. On the other hand, a mode of 61 indicated that they did not understand the components but implemented them and 55 indicated that they understood the components and implemented them. The score of 2 entails that most of the teachers possessed the conceptual understanding of the components of the lesson plan but they could not implement them in the classroom.

In part 3, below are the findings as obtained from the conceptual knowledge test. Since this was a survey, the findings reported here concentrated on some of the notable responses highlighted as examples.

a. Preliminary Details

Respondents were asked to explain preliminary details. Most respondents (23 out of 30) were not able to explain the concept of preliminary details of a lesson plan. This excerpt suggests that the respondent did not fully understand the preliminary details component of the lesson plan.

For example, Teacher TC3 wrote,

“Preliminary details consist of the first information that we write in a lesson plan such as my name, the school name, date, topic and the duration of the lesson.”

b. Specific Learning Outcomes

Respondents were asked to explain what specific learning outcomes are. Most respondents (20 out of 30) were not able to explain specific learning outcomes as a component of a lesson plan. For example, Teacher TC1 wrote,

“Specific learning outcomes are short descriptions of what is to be expected from the learners after undertaking the lessons. It is more like the objectives of the class.”

In the same manner, another respondent TB9 wrote,

“Specific learning outcomes gives a clear picture of the specific objectives of the study in terms of how learners will understand and the knowledge that they will acquire after undertaking the class.”

These excerpts indicate that most of the respondents had an idea of specific learning outcomes. However, they conceptualized them as objectives and not learning outcomes.

c. References

Respondents were asked to explain the references written in the lesson plan during science lessons. Most respondents (22 out of 30) had knowledge of the concept of references but

did not know how references are written in the lesson plan. This shows that the respondent understood references, however, did not know the correct referencing as well as the number of references required, which includes an online sources of literature.

For example, Teacher TB8 wrote,

“References can be understood as the material where the teacher will refer to as the learning takes place. There is no standard of writing references as long as the material is indicated.”

d. Teaching and learning materials.

Respondents were asked to explain teaching and learning materials. Most respondents (24 out of 30) were able to define teaching and learning materials without difficulties. For example, respondent TC16 wrote,

“Teaching and learning materials refer to every object that will be used for the purpose of learning in a classroom. These include those that will be used by the teacher and those to be used by the learner.”

Similarly, respondent TC2 wrote,

“Teaching and learning materials are those items that will be used for demonstration of certain exercises in a classroom setting. Every class should be demonstrative and so all material that is used in this process is referred to as teaching and learning material.”

These extracts inform that respondents were abreast with the definition of teaching and learning materials.

e. Rationale

Respondents were asked to explain rationale of the lesson plan. Most respondents (21 out of 30) were not able to fully define rationale of the lesson plan. Their definitions only leaned towards significance while leaving out other important components. For example, respondent TA2 wrote,

“The rationale of a lesson plan refers to the importance of the objectives set up in a lesson plan. It gives a picture of the reason behind the written lesson plan.”

Another respondent TB8 also wrote,

“The rationale refers to the reason behind a particular class or lesson. Therefore, a lesson plan should show the significance of a particular class.”

These quotations indicate that most teachers did not fully understand the concept of rationale of the lesson plan which should consist of topic, content, significance, value and importance.

f. Pre-requisite knowledge

Respondents were asked to explain pre-requisite knowledge of the lesson plan during science lessons. Most respondents (22 out of 30) were not able to define pre-requisite knowledge as required. For example, Teacher TC2 wrote,

“Pre-requisite knowledge refers to the knowledge that learners need to have in order for the present lesson effective. It entails previous lessons from which the present lesson is to build from.”

g. Start of the lesson

Respondents were asked to explain the start of the lesson. Most respondents (23 out of 30) were able to describe start of the lesson, not in full. For example, respondent TB6 wrote,

“The start of the lesson shows how the class would be introduced to the learners in order for them to be able to capture the class without difficulties.”

This excerpt was similar to the rest extracted from the conceptual test. This showed that most teachers were able to describe the start of the lesson. The correct explanation should include description of activities depicting real life situation, that provoke learner thinking and motivation to achieve the lesson outcomes through a well coined key question.

h. Lesson development and progression

Respondents were asked to describe lesson development and progression. Most respondents (22 out of 30) were not able to describe lesson development and progression depicting a teacher-centered approach in teaching. For example, Teacher TA7 wrote,

“Lesson development and progression shows how knowledge will be administered to the learners. It also shows the approaches of the teacher to ensure that learners grasp the concepts.”

Teacher TA3 also wrote,

“Lesson development and progression means the actions taken to undertake a particular lesson.”

These excerpts suggest that respondents could describe what was involved in lesson development and progression in terms of what a teacher does in class and not what learners do in class. For example, during lesson development and progression, learners should be engaged in an activity by hypothesising, debating, justifying, questioning, demonstrating while the teacher provides support based on assessment made and presentation done collaboratively with learners.

i. Ending the lesson.

Respondents were asked to describe ending the lesson. Most respondents (25 out of 30) were able to identify when ending the lesson as a component of the lesson plan came and some aspects that happen but could not provide a conceptual understanding of it in totality. For example, Teacher TB10 wrote,

“Ending the lesson shows how the lesson will be ended. It shows the conclusions of the lesson as well as a recap of the learning outcomes.”

Equally, Teacher TC2 wrote,

“Ending the lesson shows the summary of what has been taught and learnt in a lesson. It should be brief and concise”

These excerpts suggest that teachers had some knowledge of the concept of ending the lesson. However, it must be emphasized that lessons should end with learners using mathematical or scientific language, reasoning, expressions and representations in summarising the main points of a lesson collaboratively with the teacher; link to the next related concept.

j. Lesson Evaluation

Respondents were asked to explain lesson evaluation. Most respondents (24 out of 30) had an idea of what consists lesson evaluation but they were not able to explain lesson evaluation as required. For example, Teacher TB10 wrote,

“Lesson evaluation consists of the evaluations that are done to ascertain whether or not the learners have understood the contents of the lesson.”

In the same manner, respondent TC3 wrote:

“Lesson evaluation looks at the modes of evaluating the learners at the end of each class. It also denotes what the responses of the learners regarding a particular lesson.”

These excerpts indicate that the respondents were not able to explain lesson evaluation as required. However, it must be mentioned that evaluation is intrinsically more complex than writing a test, giving it to a group of students, scoring it, and handing it back with some sort of letter grade. Indeed, it involves a combination of procedures and designs that not only gauge students' work but also help them grow in the process.

In summary, the conceptual test indicated that most teachers had ideas on the meaning of the concepts of a lesson plan. However, the conceptual understanding of the concepts of the lesson plan was not fully baked among the primary school teachers investigated. However, in part 1, it was revealed that that most of the teachers possessed the conceptual understanding of the components of the lesson plan but they could not implement them in the classroom. Therefore, this study shows that the teachers claim to possess the conceptual understanding of the components of a lesson plan when in reality their

conceptual understanding of the concepts is not fully baked. This has implications on practice as a professional teacher.

4.3 What primary teachers write on the components of a science lesson plan

The researcher sought to outline what primary teachers write on the components of a science lesson plan. To achieve this, the researcher made use of an observation schedule in which the ten components of the lesson plan namely Preliminary Details, Specific Learning Outcomes, References, Teaching and Learning Materials, Rationale, Pre-requisite Knowledge, Start of the Lesson, Lesson Development and Progression, Ending the Lesson and Lesson Evaluation were used to rate the contents of primary teachers' lesson plans. The researcher used a five-point scale with starting from 0 to 4 to rate each performance item on the component of the lesson plan. In table 3 the teachers were rated on how they prepared the lessons. The rating descriptions were different for each component (refer to Appendix 5 A). The ratings were from 0 to 4, with 0 as the list performance or even missing while 4 was the best practice expected on each component.

Table 3. Teachers' ratings of the lesson plans checked in relation to the lesson plan components as performance areas during science lessons

Lesson plan component	0	1	2	3	4
Preliminary Details	1	8	12	6	3
Specific Learning Outcomes	7	6	9	5	3
References	4	9	7	9	3
Teaching and Learning Materials	4	9	8	6	3
Rationale	3	5	12	8	2
Pre-requisite Knowledge	3	4	12	9	5
Start of the Lesson	0	6	10	7	7
Lesson Development /Progression	1	5	11	7	6
Ending the Lesson	0	3	6	10	11
Lesson Evaluation	5	8	11	3	3
MODE	28	63	98	70	45

Table 3 shows that the most teachers were rated at 2 on the scale rating of 0 to 4 in writing the components of a lesson plan with the highest occurrence of 98.

Table 4 shows the meaning of the rating of 2 on each component.

Table 4. Meaning of teacher’s rating of 2 for each component of the lesson plan

Meaning of rating of 2	Rating at 2
Preliminary Details	Incomplete details mentioned
Specific Learning Outcomes	Outcomes consistent with syllabus, realistic considering duration of the lesson, but not the learners and learning environment.
References	2 resources stated
Teaching and Learning Materials	Appropriate but ordinary
Rationale	Includes any 2 of the following: Topic/content; Significance/ value/relevance/importance; methodology/strategy/approach; position
Pre-requisite Knowledge	Mentions the appropriate knowledge and skills required to attain the new outcome
Start of the Lesson	Provides a narrative introduction
Lesson Development /Progression	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario by presentation,
Ending the Lesson	Planned to end with teacher summarising the main points of a lesson

4.4 Primary teachers’ implementation of the written science lesson plan

Furthermore, the study sought to explain primary teachers’ implementation of the written lesson plan. In order to achieve this, the researcher made use of an observation schedule with performance items namely Start of the Lesson, Learning Activities, Utilisation of Teaching and Learning Materials, Ending the Lesson and Lesson Evaluation using a five-scale rating of 0 to 4. The results obtained through the observation schedule are as shown in Table 5.

Table 5. Frequencies of the ratings of how the teachers delivered the science lessons

Lesson plan component	0	1	2	3	4
Start of the Lesson	3	5	6	9	7
Learning Activities	2	4	9	9	6
Utilisation of Teaching and Learning Materials	4	11	9	5	1
Teaching Strategies	5	11	8	4	2
Ending the Lesson	0	4	5	9	12
MODE	14	35	37	36	28

Table 5 shows that most of the teachers are rated at 2, with the highest occurrence of 37. Table 6 below shows the meaning of the rating at 2 for each component in implementing a lesson plan.

Table 6. Meaning of the teacher’s ratings at 2 for each of the performance areas in implementing a lesson plan.

Lesson plan component	Rating at 2
Start of the Lesson	Provided a narrative introduction
Learning Activities	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario and made presentation to the whole class,
Utilisation of Teaching and Learning Materials	TLMs available and are appropriate; Learners understand provided TLMs; Teacher demonstration
Teaching Strategies	Includes any two of the following: Uses differentiated teaching strategies; promotes cooperative learning; Utilises technology to promote learning; employs enquiry-based strategies; and graphic organisers
Ending the Lesson	Teacher summarised the main points of a lesson

4.5 **Chapter Summary**

This chapter presented the findings of the study in line with the research objectives. It first explored the primary teachers' conceptual understanding of the components of a science lesson plan. Secondly, the study determined what primary teachers write on the components of a lesson plan. Lastly, the study found out what primary teachers' implemented in written science lesson plans. The demographic information did not have an effect on the results of the study.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Overview

This section discussed the findings as presented in the previous section regarding primary teachers' conceptual understanding and implementation of the components of a Lesson Plan in three selected primary schools in Chibolya Zone in Lusaka District. In this chapter, like the preceding chapter, findings have been organized and discussed according to the sequence of the three objectives of the study.

5.1 Primary teachers' conceptual understanding of the components of a science lesson plan

The study established primary teachers' conceptual understanding of the components of a lesson plan. The key finding, as evidenced in the study, indicated that the majority of primary teachers either possessed knowledge of the components but failed to apply them in practice, or lacked understanding of the components but still incorporated them into their lesson preparation. For example, the majority of respondents did not understand the preliminary details component of a lesson plan but implemented it while the other majority understood it but did not implement it. A close look on this finding reveals that primary teachers had variation in understanding of the components of a lesson plan. The reason might be attributed to the fact that the teachers were not formally inducted on the components of the lesson plan which might have led to their lack of strict adherence to the pedagogical principles of effective teaching. This finding resonated with Bektı and Muhroji (2021) who found that Teachers find it difficult to implement learning activities that follow the Lesson Plans.

Further findings showed that teachers had superficial understanding of the various components of a lesson plan as evidenced in the conceptual knowledge test. Unlike experienced teachers who have acquired the knowledge and skills to visualize how a lesson plan may unfold, and improvise some of what they say and do in the classroom, some teachers and novice teachers lack this knowledge, and therefore, have to prepare and write their daily lesson plans before stepping into the classroom. The need to train teachers in lesson planning has an even more heightened relevance in the sub-Saharan

nations' context today as the adoption of the Competency-Based Approach in recent years has led to changes in curricula and lesson design, and raised the stakes in terms of standards for learning and teaching by increasing demands on teachers.

Teachers' most important trait is confidence. Lesson planning can help the teacher to be well prepared and be aware of what the teacher intends on teaching the students. There are a number of benefits to writing a lesson plan. First, lesson planning produces more unified lessons. It gives teachers the opportunity to think deliberately about their choice of lesson objectives, the types of activities that will meet these objectives, the sequence of those activities, the materials needed, how long each activity might take, and how students should be grouped. Teachers can reflect on the links between one activity and the next, the relationship between the current lesson and any past or future lessons, and the correlation between learning activities and assessment practices. Because the teacher has considered these connections and can now make the connections explicit to learners, the lesson will be more meaningful to them.

Suggestions for teachers to remedy the difficulties faced by them in understanding the components of lesson plans include among other things: acquiring knowledge through observation seminars discussions reading to develop knowledge of standard format if any, modern methods, constructivism behaviourism, better opportunity for direct experiences with schools, which may develop awareness of student standards, availability of aids, getting more time to practice different models or even mixed according to teacher aptitude. Student teachers require their educators and mentors to de-emphasize textbook as the source of ideas. Flexibility to attempt a few lessons off-hand, without written plan and compare the results with planned lessons may make student teachers aware of the benefits of systematic planning. Flexibility is required by them in allowing daily random variations in formats and to consider issues and methods other than those suggested in teacher source book, and to select topic of their choice.

For novice teachers during the early phase of their professional learning, they need to know what a lesson plan actually is, as well as understanding the crucial nexus that exists between planning and teaching. Flexibility is required as student teachers do not fancy to adhere to educators plan rigidly. If teachers fail to make adjustments based on how their

class is going, they will miss valuable learning opportunities and to develop alternative plans.

5.2 What primary teachers write on the components of a science lesson plan

The researcher also sought to determine what primary teachers wrote on the components of a science lesson plan. It was found that most teachers scored average scores implying that the contents of the lesson plan were not satisfying the standards of a good lesson plan. The score was average owing to incomplete details mentioned, outcomes consistent with syllabus, realistic considering duration of the lesson, but not the learners and learning environment. However, it should be highlighted that some of the components such as start of the lesson, lesson development and end of lesson were appropriately written by the majority of teachers while others such as preliminary details, rationale, lesson development and progression and references were poorly written. This finding is in line with Matimolane and Sanders (2004) who contended that there are concerns that the lesson planning of many teachers may be inadequate, which could be a factor inhibiting some teachers from meeting planning requirements such as designing lessons around outcomes; using learner-centred and activity-based approaches that involve the development of skills; and including continuous assessment which contributes to the learning process.

The study found that some teacher lesson plans did not have some components that are fundamental in lesson delivery. This might be attributed to many factors including inadequate knowledge in designing of lesson plans. Planning lessons is a fundamental skill all teachers must develop and hone, although implementation of this skill in actual teaching can, and usually does, take some time. It is accepted that existing teacher education take the school curriculum and textbooks as ‘given’ and train teachers to adjust to the needs of the existing school system through fastidious planning of lessons in standardized formats and fulfilling the ritual of delivering the required number of lessons and hence operates with rigid lesson plan formats.

5.3 Primary teachers’ implementation of the written science lesson plan

The study identified five aspects in the implementation of written lesson plans; Start of the Lesson, Learning Activities, Utilisation of Teaching and Learning Materials, Teaching

Strategies, and Ending the Lesson. The study revealed that there were discrepancies between what was written in the lesson plans and what was being implemented in the development of the lessons. The findings of the study are consistent with Garrison and Kanuka (2004) who noted that although the lesson plan is essential for improving teaching and learning capacity, in practice, the implementation of lesson plan in the classroom is rarely practiced. The literature often reports that having no knowledge of making lesson plan is the main challenge to make and implement lesson plan-induced session in the classroom.

In general, teachers have no idea about necessary theories of lesson plan and their blending strategy for making lesson plan (Jahjouh, 2014). Every teacher needs to follow a lesson plan for effective teaching, students' learning and classroom management for fulfilling the learning outcome because it is labelled as 'the hidden world of teaching' or 'quality improvement activity'. Lesson plan helps a teacher to utilize time, resources, materials and techniques at an optimum level. The Lesson Planning depends on the educational goals. These goals are set by the school, which is the one in charge of setting a certain teaching modality with a set of appropriate methodological strategies.

Lesson planning is regarded as difficult for teachers to learn, with a problematic range of outcomes (Bailey, 2015). For example, teachers are planning on their own, their responses range from creativity to bewilderment and anxiety. More experienced teachers' planning is likely to involve a concurrent consideration of a wide number of elements, rather than a linear progression of decision-making. However, a teacher's level of experience is only one factor influencing a teacher's planning. Others include depth of subject knowledge and pedagogical knowledge, teaching style, and perceptions and knowledge of pupils. Some teachers are likely to engage in short-term planning, and generally describe planning as time-consuming and complex. Once exposed to teaching, novices begin to realise that planning and preparation are concepts associated with unpredictability, flexibility and creativity. Therefore, there is need for teachers to be instructed on the importance of correlation between the written lesson plan and what is implemented in the classroom. Based on the findings, the researcher is in agreement that teachers need to

conceptualise the components of a lesson plan in order to be more efficient and effective in delivery of lessons.

5.4 Implications for practice

The findings of this study have instructional implications related to primary teachers' conceptual understanding of the components of a lesson plan. It is evident from the findings in this research that the majority of primary teachers either possessed knowledge of the components but failed to apply them in practice, or lacked understanding of the components but still incorporated them into their lesson preparation. Furthermore, some primary teachers' ability to make use of components of a lesson plan that are fundamental in science lesson delivery was low. These findings have important implications on primary teachers' conceptual understanding as well as implementation of the lesson plan in science lesson delivery.

Lesson plans are important because they provide structure and a sense of purpose for each class period. A well-developed lesson plan is like a map for teachers, giving them a clear sense of purpose and direction for each lesson. According to Cuñado and Abocejo (2018), a well-executed lesson plan brings about competent teachers who become effective and efficient educators. Furthermore, there is need for teachers to be intellectually innovative in their understanding and implementation of lesson plans. As such, primary teachers' education planning courses need to have relevant science content and pedagogical strategies to enhance teachers' understanding of concepts and effective instructional practices for teaching in schools.

5.5 Theoretical Implications of the study

The results of this study resonate with the tenets of practitioner framework elaborated in the first chapter of this study. For example, teachers' low conceptual understanding of some of the key components of the lesson plan were manifestations of lack of interrelation between concepts and practise perspectives by the participants of the study. According to Schwartz (2015), the ideal scholar practitioner interrelates concepts, understandings, and methods from varied theoretical and practice perspectives. Furthermore, the teachers' failure to provide detailed conceptual descriptions of the components of the lesson plan was due to their low prior knowledge about the lesson plan and how to effectively use it

for science lesson delivery. Furthermore, discrepancies between what was written in the lesson plans and what was being implemented in the development of the science lessons revealed lack of interconnectedness between concepts, methods and practise by the teachers. Based on these findings in relation to theory, the researcher was of the view that teachers need to become practitioners so as to interrelate concepts from varied theoretical and practical perspectives.

5.6 Chapter Summary

This chapter discussed the findings of the study in line with the research objectives. It was discussed that primary teachers had variation in understanding of the components of a science lesson plan. Furthermore, most of the lesson plans lacked details in various components of the lesson plans attributed to many factors such as inadequate knowledge in designing of lesson plans. Lastly, there were discrepancies between what was written in the lesson plans and what was being implemented in the development of the science lessons signalling lack of goal setting by schools in enforcing certain teaching modality with a set of appropriate methodological strategies.

CHAPTER SIX: CONCLUSION AND RECOMENDATION

6.0 Overview

The previous chapter discussed research findings on primary teachers' conceptual understanding and implementation of the components of a Science Lesson Plan in three selected primary schools in Chibolya Zone in Lusaka District. The study gave a comprehensive report primary teachers' conceptual understanding of components of a lesson plan, what primary teachers write on the components of a science lesson plan as well as primary teachers' implementation of the written lesson plan during science lessons. In this chapter, conclusions drawn from the investigation are also outlined. In addition, recommendations, based on the findings of the study are given.

6.1 Conclusion

Regarding primary teachers' conceptual understanding of the components of a lesson plan, it can be concluded that most primary teachers either understood the components of a lesson plan but did not implement them or that they did not understand the components but implemented them in the development of science lessons. Further findings showed that teachers had shallow conceptual understanding of the various components of a lesson plan as evidenced in the conceptual knowledge test. The findings imply that more interventions need to be undertaken both at policy and school level to ensure that lesson plans are understood and applied in practice. Secondly, it can be concluded, as evidenced from lesson plan checklist during science lessons, that lesson plans lacked details in various components. Regarding primary teachers' implementation of the written lesson plan, it has been concluded that there are discrepancies between what is written in the lesson plans and what is being implemented in the development of the lessons.

6.2 **Recommendations**

Based on the findings of the study, the following recommendations were made:

1. It is recommended that policy be suggested to introduce mandatory continuous professional development as a potential development for teachers to acquire skills for developing lesson plans.
2. It is recommended that there should be clear teacher guides in schools in terms of the appropriate design and format of the lesson plans by teachers.
3. In strengthening compliance to lesson plan implementation, more classroom inspections should be undertaken by education inspectors as well as school administrators.

6.3 **Recommendations for future research**

Further studies are required to assess the role of teacher training colleges in fostering better understanding and implementation of lesson plans.

REFERENCES

- Abid, A. K. (2021). The Effectiveness of Collaborative Team Meeting Strategy to Develop EFL Prospective Teachers' Planning Lesson and Lesson Delivery Quality Lesson. *Review of International Geographical Education Online*, 11(7).
- Adam, S. (2004). *Using learning outcomes. A consideration of the nature, role, application and implications for European education of employing 'learning outcomes' at the local, national and international levels*. United Kingdom Bologna Seminar, Edinburgh, Scotland.
- Adams, M.E. (2016). *Preparing Effective Lesson Plans for Middle and Secondary School Teachers*. Crawfordsville: Indiana Fall.
- Akpan, C. (2018). *Types of Educational Planning and Reasons for Planning Education*. University of Calabar, Calabar.
- Alexander, R. (2000). *Culture and Pedagogy: International comparisons in Primary Education*. Oxford: Blackwell.
- Artaya, I. P. (2018). *The concept of operations and production management: The Basics Of Operations Management and Production 2018 Edition*.
- Bailey, J. (2015). *The challenge of supporting a beginning teacher to plan in primary mathematics*. The University of Waikato.
- Bekti, L., & Muhroji, R. (2021). Analysis of Lesson Plan Implementation for Learning at SDN 1 Mojopuro. *Advances in Social Science, Education and Humanities Research*, 662(2): 454 – 458.
- Borich, G. D. (2000). *Effective Teaching Methods*. Prentice Hall: London. 4th edition.
- Borman, G. D., & Kimbal, S. M. (2005). Teacher quality and educational equality: Do teachers with higher standards-based evaluation ratings close student achievement gaps? *Elementary School Journal*, 106(1): 3-20.
- Bowen, G. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 1(9): 27-40.
- Cabrera, D., & Colosi, L. (2012). *Thinking at Every Desk: Four Simple Skills to Transform Your Classroom*: W. W. Norton.

- Cevikbas, M., König, J., & Rothland, M. (2023). Empirical research on teacher competence in mathematics lesson planning: Recent developments. *ZDM–Mathematics Education*, 1-13.
- Clark, C. M., & Dunn, S. (1991). Second-Generation Research on Teachers' Planning, Intentions, and Routines. In H. C. Warren and H. J. Walberg (Eds.), *Effective teaching: Current research* (pp. 183-200). Berkeley, CA: McCatchum Publishing.
- Cohen, L. (2000). *Research Methods in Education, 5th Edition*, Great Britain.
- Crotty, M. (2003). *The Foundations of Social Research: Meaning and Perspectives in the Research Process*. London: Sage Publications, 3rd edition, 10.
- Cullen, J. B., Long, M. C., & Reback, R. (2013). Jockeying for position: Strategic high school choice under Texas' top ten percent plan. *Journal of Public Economics*, 97(3): 32–48.
- Cuñado, A. G., & Abocejo, F. T. (2018). Lesson Planning Competency of English Major University Sophomore Students. *Journal of Language Education*, 5(8): 45-56.
- Dagher, Z. R. & BouJaoude, S. (2011). Science education in Arab states: Bright future or status quo? *Studies in Science Education*, 47(1): 73-101.
- Department of Education and Training (2017). *High impact teaching strategies: Excellence in teaching and learning*. East Melbourne, Victoria: Australia.
- Diene, S. (1993). *Toward understanding teacher change*. Urbana: Centre for the Study of Reading.
- Dudley, P. (2013). Teacher Learning in Lesson Study: what interaction-level discourse analysis revealed about how teachers utilized imagination, tacit knowledge of teaching and fresh evidence of pupils learning, to develop practice knowledge and to enhance pupils' learning. *Teaching and Teacher Education*, 34(3): 107-121.
- Dudovskiy, J. (2022). The Ultimate Guide to Writing a Dissertation in Business Studies: A Step-by-Step Assistance. *Open Journal of Business and Management*, 8(4): 22-40.
- Đurđanović, M. M. (2015): The use of teaching aids and their importance for students' music education. *International Journal of Cognitive Research in Science, Engineering and Education*, 3(2): 33-40.

- Earl, L. M. (1998). *Assessment as learning: Using classroom assessment to maximize student learning* (2nd ed.). California: United States of America: Corwin Press, SAGE.
- Egan, K. (2005). *An Imaginative Approach to Teaching*. San Francisco, CA: Jossey-Bass.
- Evans, E. J. (2012). *Managing the foreign language classroom: Reflections from the preservice field and beyond*. Doctor of Philosophy Thesis, University of Iowa, 2012. doi: 10.17077/etd.tyx1wwjb.
- Examination Council of Zambia (2018). *Examination Council of Zambia Annual Report: 2018*. Lusaka: Government Printers.
- Fink, D. L. (2005). *Integrated Course Design*. Manhattan, KS: The IDEA Center.
- Fink, E. D. (2005). *A self-directed guide to designing courses for significant learning*. San Francisco: Jossey-Bass.
- Flynn, P., Mesibov, D., Vermette, P., & Smith, R. M. (2013). *Applying standards-based constructivism: A two-step guide for motivating middle and high school students*. 1-187. doi: 10.4324/9781315853734
- Fugard, A. J., & Potts, H. W. (2015). Supporting thinking on sample sizes for thematic analyses: a quantitative tool. *International journal of social research methodology*, 18(6): 669-684.
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2): 95–105.
- Godwin, M., & Meek, J. (2016). The scholarly practitioner: Connections of research and practice in the classroom. *Teaching Public Administration*, 34(1): 54–69.
- Hattie, J. (2003). *Teachers make a difference: What is the research evidence?*
- Hewson, C., Vogel, C., & Laurent, D. (2015). *Internet research methods*. Sage.
- Higgins, S., Cordingley, P., Greany, T., & Coe, R. (2015). *Teacher Development Trust; Developing Great Teaching*. Houston: Wong Publications, 12(81): 87-95.
- Higgs, L. (2013). *Theory in Educational Research and Practice in Teacher Education*. Pretoria: University of South Africa.
- Ishida, Y., Mwanza, P., Luchembe, M., & Masaiti, G. (2019). Scaling up lesson study in

- Urban and Rural Schools to realise sustainable, inclusive Teacher Professional Development in Zambia. *Journal of International Corporation in Education*.
- Iqbal, M. H., Siddiqie, S. A., & Mazid, M. A. (2021). Rethinking theories of lesson plan for effective teaching and learning. *Social Sciences & Humanities Open* 4,
- Jahjouh, Y. M. A. (2014). The effectiveness of blended e-learning forum in planning for science instruction. *Journal of Turkish Science Education*, 11(4): 3–16.
- Jansen, C., & Van Der Merwe, P. (2015). Teaching practice in the 21st century: Emerging trends, challenges and opportunities. *Universal Journal of Educational Research*, 3(3): 190–199.
- Jensen, L. (2014). Planning Lessons. In M. Celce-Murcia, *Teaching English as a Foreign Language*.
- JICA (2015). *Report of Preparatory Survey of Project for Improvement of Pedagogical Content Knowledge: Linking Pre-Service and In-Service Education in Zambia (in Japanese)*. Tokyo: JICA.
- John, P. D. (2006). Lesson planning and the student teacher: re-thinking the dominant model. *Journal of Curriculum Studies*, 38(4): 483–498.
- Johnson, C. C. (2009). An examination of effective practice: moving toward elimination of achievement gaps in science. *Journal of Science Teacher Education*, 20(3): 287-306.
- Jones, K. A., Vermette, P. J., & Jones, J. L. (2009). *An integration of "backwards planning" unit design with the "two-step" lesson planning framework*. *Education*, 130(2): 357-360.
- Joseph, O. (2015): Teaching Aids: a special pedagogy of brain development in school children, interest and academic achievement to enhance future technology. *Journal of Education and Practice*, 6(29): 92-101.
- Kanellopoulou, E., & Darra, M. (2018). The Planning of Teaching in the Context of Lesson Study: Research Findings. *International Education Studies*; 11(2): 118-125.
- Kennedy, M. F. (1994). *Instructional design or personal heuristics in classroom instructional planning*. *Educational Technology*.
- Lederman, N. G., & Niess, M. L. (2000). *Technology for technology's sake or for the*

- improvement of teaching and learning? School Science & Mathematics, 100 (7): 345-348.*
- Lingambe, A., Kasonde, E. K., & Nakai, K. (2014). *Realizing Learner-Centered Lesson through Lesson Study, Zambian Experience in African Context.*” Paper presented at International Conference of the World Association of Lesson Study (WALS), Bandung, Indonesia.
- Lovat, T., & Smith, D. (2003). *Curriculum: Action on reflection.* Sydney: Social Science Press, 2003. 4th edition.
- Maharaj, A., Brijlall, D., & Molebale, J. (2007). Teachers’ view of practical work in Teaching of fractions: A case study. *South African Journal of Education, 27(4): 697-612.*
- Mamba, C. (2020). *Establishing the role of meetings of Professional Learning Community for Teachers’ Continuing Professional Development in Chibolya and Mumuni Zones in Lusaka District, Zambia.* Lusaka: University of Zambia.
- Mambwe, R. (2020). Preparation of teachers for learner-centered instructional practice in primary colleges of education in Zambia: the constructions of social studies lecturers and pre-service final year student teachers(PhD Thesis, The University of Zambia). The University of Zambia Repository. <https://dspace.unza.zm/items/f4c66008-d1e4-46d6-a5a9-8c2d7027e454>
- Mambwe, R., Chishimba, P. C., & Manchishi, C. P. (2019). Student Teacher Preparation and Self-Efficacy Beliefs about Inductive Teaching Learning Methods in Primary Colleges of Education, Zambia. *International Journal of Education and Research, 7(2), 179-196.* <https://www.ijern.com/February-2019.php>
- Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement.* Alexandria, VA: Association for Supervision and Curriculum Development.
- Matimolane, M., & Sanders, M., (2004). *Teachers' lesson planning practices, and the accuracy of their self-reports.* Buffler, A. & Laugksch, R.C. (Eds.).
- Milagro, P. R. (2009). Principles of Lesson Planning: A Guide for Student Teachers. *Revista Káñina, 33(2): 201-209.*
- Ministry of General Education and JICA (2015). *Completion Report on the Technical*

- Cooperation Project for Strengthening Teachers' Performance and Skills (STEPS) through School-based Continuing Professional Development.* Lusaka: Ministry of General Education and JICA.
- Miyoba, R., & Banja, M. (2018). Teachers' perceptions regarding the role of practical work in teaching integrated science at junior secondary school level in Zambia. *UNESWA Journal of Education*, 1(2): 65-79.
- Mumba, M. (2019). *Contribution of Lesson Preparations to the Academic Performance of Evening Class Students: A Case of Fibobe Primary School, Ndola, Zambia.* Lusaka: University of Zambia.
- Mutton, T., Hagger, H., & Burn, K. (2011). Learning to plan, planning to learn: The developing expertise of beginning teachers. *Teachers and Teaching: theory and practice*, 17(4): 399-416.
- Nakabugo, M. G., & Siebörger, R. (2001). Curriculum reform and teaching in South Africa: making a 'paradigm shift'? *International Journal of Education Development*, 21(1): 21-35.
- NCTE (2009). *National Curriculum Framework for Teacher Education: Towards Preparing Professional and Humane Teacher.* New Delhi: National Council for Teacher Education.
- Nzabonimpa, J. P. (2018). Quantitizing and Qualitizing impossibilities in mixed methods research. *Methodological Innovations*, 11(2), 2059799118789021.
- Okwori, A. (2011). *Conceptual and Practical Approach to Educational Planning.* Makurdi: Aboki publishers.
- Omstein, A. C., & Lasley, T. J. (2004). *Strategies for Effective Teaching (3rd ed.).* Boston: McGraw Hill.
- Peerzada, N. (2016). Educational Ideas of Fridrich August Froebel. *International Journal of Scientific Research and Education*, 4(2): 4983 - 4988.
- Ponto, J. (2015). Understanding and Evaluating Survey Research. *Journal of the Advanced Practitioner in Oncology*, 6(2): 168-171.
- Popham, W. J. (2013). *Classroom assessment: What teachers need to know (7th ed.).* Boston, MA: Pearson.
- Provincial Education Office (2019). *Provincial Education Office Report: 2019.* Lusaka:

Government Printers.

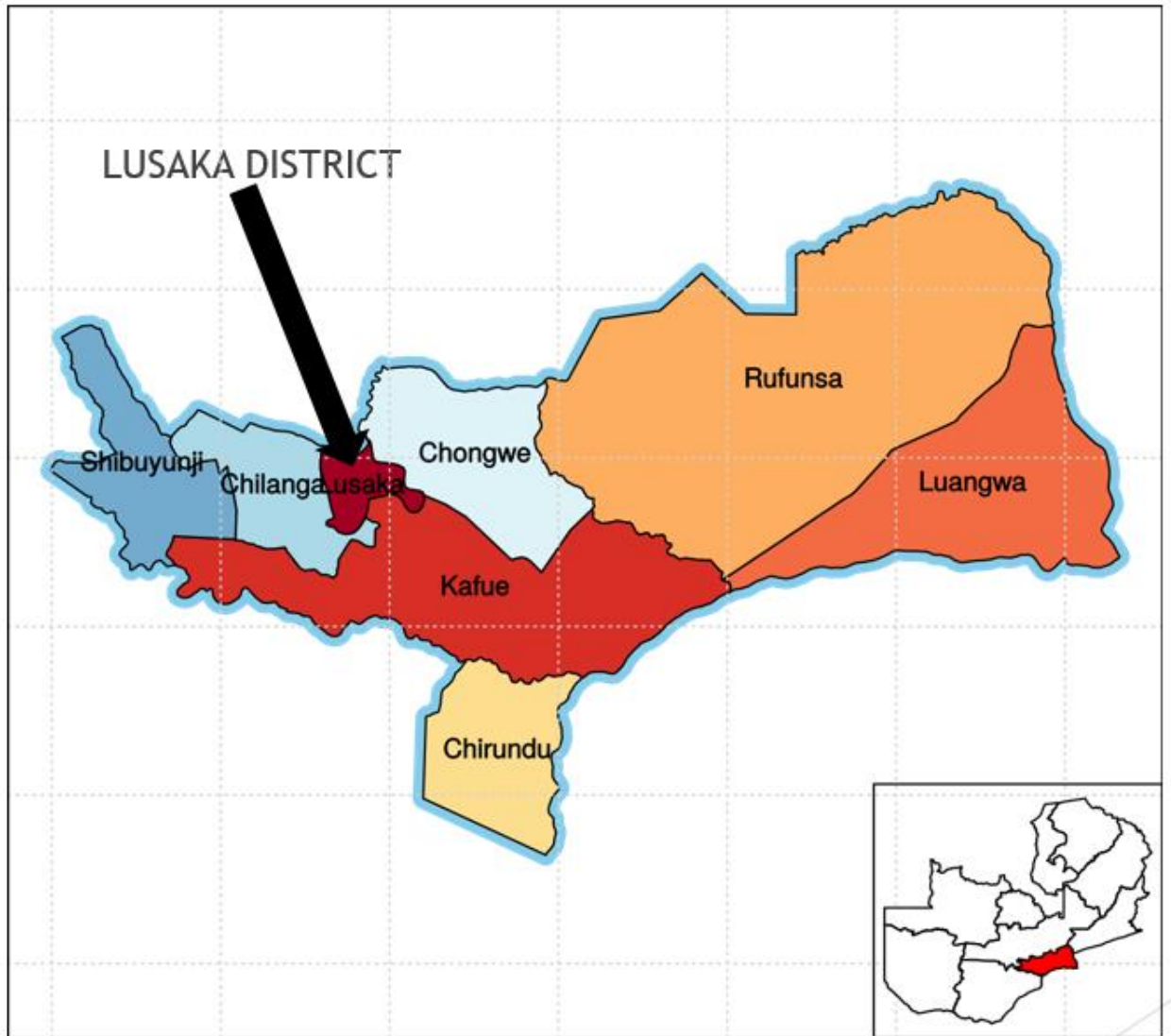
- Reiser, R. A. (1994). *Examining the planning practices of teachers: Reflections on three years of research*. Educational Technology, March 1994, 11-16.
- Richards, J. C., & Bohlke, D. (2011). *Creating effective language lessons*. New York, NY: Cambridge University Press.
- Rigg, C., Ellwood, P., & Anderson, L. (2021). Becoming a scholarly management practitioner: Entanglements between the worlds of practice and scholarship. *International Journal of Management Education*, 19(2): 22-34.
- Robinson, P. J. (2015). *Getting millions to learn: How did Japan's Lesson Study program help improve education in Zambia?* Global Economy and Development, Center for Universal Education.
- Rodriguez, K. F. R., & Abocejo, F.T. (2018). *Competence vis-à-vis performance of special education pre-service teachers*. *European Academic Research*, 6(7): 3474-3498.
- Rodriguez-Gallego, M. R. (2007). *Lesson Planning for Primary and Secondary Education*. University of Sevilla.
- Saad, A. (2011). *A case-based System for lesson plan construction*. Unpublished PhD dissertation. Loughborough University.
- Salsbury, D. E., & Schoenfeldt, M. (2008). *Lesson Planning: A Research-Based Model for K-12 Classrooms*. Alexandria, VA: Prentice Hall.
- Sanchez, G. V., & Valcárcel, M. V. (1999). Science teachers' views and practices in planning for teaching. *Journal of Research in Science Teaching*, 36(4): 493-513.
- Schon, D. (1983). *The reflective practitioner*. New York, N.Y.: Basic Books.
- Scott, L. C. (2015). *The futures of learning 3: What kind of pedagogies for the 21st century?*. UNESCO.
- Schwartz, E. (2015). "Bringing it all back home": An interdisciplinary model for community-based learning. *Journal of College and Character*, 16(1): 53-61.
- Shavelson, J., & Stern P. (1981). *Research on teachers' pedagogical thoughts, judgements, decisions, and behavior'*. *Review of Educational Research*, 51(4): 455 – 498.
- Shen, J. Poppink, S., Cui, Y., & Fan, G. (2007). *Lesson Planning: A Practice of*

Professional Responsibility and Development.

- Shen, J., Zhen, J., & Poppink, S. (2007). Open Lessons: A Practice to Develop a Learning Community for Teachers. *Educational Horizons*, 85(3): 181–191.
- Spady, W. (1994). *Outcomes Based Education: Critical Issues and Answers*. American Association of School Administration: Arlington, Virginia.
- Stiggins, R. J. (2008). *An introduction to student-involved assessment for learning*. Upper Saddle River, N.J: Person/Merrill Prentice Hall. Darling-Hammond and Bransford.
- Stronge, J. H. (2007). *Qualities of Effective Teachers (2nd ed.)*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Summers, P. (2018). Practitioner development - From trained technicians to reflective practitioners: a systemic study within a United Kingdom unitary authority. Thesis, Degree of Doctor of Philosophy of the University of Portsmouth
- Sural, S. (2019). *An examination of Pre-Service Teacher's Competencies in Lesson Planning*. Pamukkale University, Turkey.
- Tashevskva, S. (2008). *Some lesson planning problems for new teachers of English*. *Proceedings of the Language—A Phenomenon without Frontiers 5th International Conference from 12-14 June 2008 in Varna, Bulgaria*.
- Tyler, R. W. (1949). *Basic principles of curriculum and instruction*. Chicago University of Chicago Press.
- Wong, H., & Wong, R. T. (2009). *The First Days of School: How to be an Effective Teacher*. Houston: Wong Publications, 12(81): 87-95.
- Yamane, T. (1967). *Statistics, an Introductory Analysis, 2nd Ed*. New York: Harper and Row.
- Yildirim, A. (2003). *Instructional planning in a centralized school system: lessons of a study among primary school teachers in Turkey*” *International Review of Education*, 49(5): 525–543.
- Zazkis, R., Liljedahl, P., & Sinclair, N. (2009). *Lesson plays: planning teaching versus teaching planning*.
- Zulu, L. (2016). *Attitude of teachers towards lesson planning: Classroom management perspective in selected public schools of Kitwe District*. Master's Degree Dissertation. Lusaka: UNZA.

APPENDICES

Appendix 1: Maps



Appendix 2: Consent Form

RESEARCH TITLE: Primary Teachers' Conceptual Understanding and Implementation of Components of a Science Lesson Plan in three selected Primary Schools of Chibolya Zone, Lusaka District.

RESEARCHER: BETTY BETHAR MAMBWE

If you agree to participate in this study, kindly consent by signing this document:

ATTESTED CONSENT

I understand all that has been explained to me as above and it is clear to me what this study is all about. Therefore, I voluntarily consent to take part in the study. I agree to provide information for the study on my own without coercion.

Participant Signature: _____

Date: _____

Appendix 3: Questionnaire for all respondents

UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

Dear Respondent, I am **Betty Bethar Mambwe**, a student of the University of Zambia currently undertaking a research on primary teachers' conceptual understanding and implementation of components of a Science Lesson Plan in the case of teachers in three selected primary schools in Chibolya Zone in Lusaka District. The study is in partial fulfilment of the academic requirements for the award of Degree of Master of Education in Primary Education. This questionnaire is purely for academic purpose and the information provided shall be treated with utmost confidentiality. I kindly request you to spare a few minutes and fill this questionnaire as genuinely as possible. Thank you.

INSTRUCTIONS:

- Indicate answers to questions by ticking [\surd] in the boxes provided
- For the sake of confidentiality, do not write your name on the questionnaire.
- Write the identity number given to you by the researcher.

Part 1: Personal Information

1. Sex: Male Female

2. Age Range:

Under 25 years

Between 25 and 35years

Between 36 and 45years

Between 46 and 55years

Above 55 years

3. Level of Education:

Diploma

Degree

Masters

Other (Indicate)

Part 2: CONCEPTUAL UNDERSTANDING AND IMPLEMENTATION

Rate your understanding and implementation of the following performance areas of a lesson plan by ticking (√) in an appropriate box using the key below.

1 = I do not understand it and I do not implement it

2 = I understand it but, I do not implement it

3 = I do not understand it but, I implement it

4 = I partly understand it and I partly implement it

5 = I understand it and I implement it

Performance Area	1	2	3	4	5
Preliminary Details					
Specific Learning Outcomes					
References					
Teaching and Learning Materials					
Rationale					
Pre-requisite Knowledge					
Start of the Lesson					
Lesson Development /Progression					
Ending the Lesson					
Lesson Evaluation					

Part 3: CONCEPTUAL KNOWLEDGE TEST

PRIMARY TEACHERS' KNOWLEDGE ABOUT CONCEPTS OR PHENOMENA ABOUT THE COMPONENTS OF THE LESSON PLAN.

Defining, describing or explaining the concepts or phenomena about the components of the lesson plan.

To the best of your knowledge, explain all the concepts or phenomena in the spaces provided.

Performance Area	Definition, description or explanation
Describe Preliminary Details	
Explain what the Specific Learning Outcomes are.	
Explain the References written on the lesson plan.	
Define Teaching and Learning Materials.	
Explain the Rationale of a lesson plan.	

Define Pre-requisite Knowledge of a lesson plan.	
Describe the Start of the Lesson.	
Describe Lesson Development /Progression.	
Describe the Ending the Lesson.	
Explain Lesson Evaluation.	

THANK YOU

Appendix 4: Document Analysis

Participants will be checked on their lesson plans and observed while teaching. Each performance item will be scored on a score of 0 to 4.

A. LESSON PLANNING CHECKING

Rate the teacher lesson plan in relation to the following aspects.

Performance Area	0	1	2	3	4	SCORE
Preliminary Details	No Teacher details	Teacher details; School	Teacher details; School; class	Teacher details; School; Class; date	Teacher details; School; Class; Date; Duration; time; Attendance by gender; Subject; Topic; subtopic	
Specific Learning Outcomes	No outcomes/Outcomes not consistent with the syllabus	Outcomes consistent with syllabus, but not realistic considering time, the learners and learning environment.	Outcomes consistent with syllabus, realistic considering duration of the lesson, but not the learners and learning environment.	Outcomes consistent with syllabus, and realistic considering duration of the lesson and the learners but not learning environment.	Outcomes consistent with syllabus, and realistic considering duration of the lesson, the learners and learning environment.	
References	No references	1 resource stated	2 resources stated	3 resources stated, but poorly referenced.	At least 4 resources well referenced inclusive of the syllabus and 1 online resource	
Teaching and Learning Materials	No TLMs	Available but inappropriate	Appropriate but ordinary	Innovative with potential to help learners perform according to specified outcomes	Innovative with potential to help learners perform beyond specified outcomes	

Performance Area	0	1	2	3	4	SCORE
Rationale	No rationale	Includes anyone of the following: Topic/content; Significance/value/relevance/importance; methodology/strategy/approach; position	Includes any 2 of the following: Topic/content; Significance/value/relevance/importance; methodology/strategy/approach; position	Includes any 3 of the following: Topic/content; Significance/value/relevance/importance; methodology/strategy/approach; position	Includes All of the following: Topic/content; Significance/value/relevance/importance; methodology/strategy/approach; position	
Pre-requisite Knowledge	No pre-requisite knowledge	Mentions prior knowledge and skills	Mentions the appropriate knowledge and skills required to attain the new outcome	Mentions and assesses the specific knowledge and skills required to attain the new outcome	Mentions, assesses and uses the specific knowledge and skills required to attain the new outcome	
Start of the Lesson	Start unconnected to the lesson outcomes	Starts with definition of terms	Provides a narrative introduction	Provides for activity/scenario related to lesson outcomes	Provides for activity/scenario depicting real life situation, that provokes learner thinking and motivation to achieve the lesson outcomes through a well coined key question	
Lesson Development /Progression	narration/explanation without learner engagement	learners working in groups, presentation	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario by presentation,	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario by hypothesising/predicting, debating, justifying, questioning, demonstrating, presentation,	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario by hypothesising/predicting, debating, justifying, questioning, demonstrating, the teacher provides support (desk-teaching, individual attention and clarifying) based on assessment made, presentation, whole class consolidation (done collaboratively with learners)	

Performance Area	0	1	2	3	4	SCORE
Ending the Lesson	Planned to end without summary	Planned to end with Exercise	Planned to end with teacher summarising the main points of a lesson	Planned to end with learners summarising the main points of a lesson collaboratively with the teacher	Planned to end with learners using mathematical/scientific language, reasoning, expressions and representations in summarising the main points of a lesson collaboratively with the teacher; link to the next related concept	
Lesson Evaluation	No provision for lesson evaluation	Provision made for lesson evaluation				

Appendix 5: Observation Schedule

A. LESSON DELIVERY OBSERVATION SCHEDULE

Rate the teacher lesson delivery in relation to the following aspects:

Performance Area	0	1	2	3	4	Score
Start of the Lesson	Start was unconnected to the lesson outcomes	Started with definition of terms	Provided a narrative introduction	Provided activity/scenario related to lesson outcomes	Provided activity/scenario (depicting real life situation), that provoked learner thinking and motivation to achieve the lesson outcomes through a well coined key question	
Learning Activities	Teacher narrated/explained without learner engagement	learners worked in groups and made presentation	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario and made presentation to the whole class,	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario by hypothesising/predicting, debating, justifying, questioning, demonstrating, presentation	learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario by hypothesising/predicting, debating, justifying, questioning, demonstrating, the teacher provided support (desk-teaching, individual attention and clarifying) based on assessment made, presentation (consider multiple methods of finding solution), whole class consolidation (done collaboratively with learners)	
Utilisation of Teaching and Learning Materials	No teaching and learning materials used	TLMs available but inappropriate (lesson outcomes, age, grade level);	TLMs available and are appropriate; Learners understand provided TLMs; Teacher demonstration	TLMs available and are appropriate; Learners understand, and use provided TLMs; Learners skilfully handling TLMs given (teacher actively engages learners in using TLMs to construct and give meaning to new concepts);	TLMs available and are appropriate; Learners understand, and use provided TLMs; Learners skilfully handling TLMs given (teacher actively engages learners in using TLMs to construct and give meaning to new concepts); learners using TLMs safely;	

Performance Area	0	1	2	3	4	Score
Teaching Strategies	Only one teaching strategy employed	Includes anyone of the following: Uses differentiated teaching strategies; promotes cooperative learning; Utilises technology to promote learning; employs enquiry-based strategies; and graphic organisers	Includes any two of the following: Uses differentiated teaching strategies; promotes cooperative learning; Utilises technology to promote learning; employs enquiry-based strategies; and graphic organisers	Includes any three of the following: Uses differentiated teaching strategies; promotes cooperative/collaborative learning; Utilises technology to promote learning; employs enquiry-based strategies; and graphic organisers	Includes all the following: Uses differentiated teaching strategies; promotes cooperative learning; Utilises technology to promote learning; employs enquiry-based strategies; and graphic organisers	
Ending the Lesson	No summary	Exercise given	Teacher summarised the main points of a lesson	Learners summarised the main points of a lesson collaboratively with the teacher	Learners used mathematical/scientific language, reasoning, expressions and representation to summarise the main points of a lesson collaboratively with the teacher; linked to the next related concept	