

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

DEPARTMENT OF EDUCATION SCIENCE AND MATHEMATICS EDUCATION



RESEARCH PROPOSAL

**Exploring teaching methods used by grade 5 teachers in teaching addition of fractions:
The case of three schools in Khami District; Bulawayo Province; Zimbabwe.**

BY

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(B225857A)

Presented to Bindura University

**In Partial Fulfillment for the Degree of Bachelor of Science Education Honours Degree in
Mathematics**

JANUARY

2025

BINDURA UNIVERSITY OF SCIENCE EDUCATION
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RELEASE FORM

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Title of Project:

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APPROVAL FORM

The undersigned certify that they have read and recommended to Bindura University of Science Education for acceptance of a research project entitled, **“Exploring teaching methods used by grade 5 teachers in teaching addition of fractions: The case of three schools in Khami District; Bulawayo Province; Zimbabwe.”**, submitted by MATARE ERNEST in partial fulfillment of the requirements for the Degree of Bachelor of Science Education Honours Degree in Mathematics

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DECLARATION OF ORIGINALITY

I declare that this project entitled **Exploring teaching methods used by grade 5 teachers in teaching addition of fractions: The case of three schools in Khami District; Bulawayo Province; Zimbabwe**, is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

MATARE ERNEST

DEDICATION

This work is dedicated to my lovely wife Fungai Matare for her unwavering support and encouragement to further my education. Thank you for the backing and love. For my three children Nyasha, Tariro and Ruramai, this is a special dedication for you. I have set the bar high which I expect you shall surpass and reach greater heights.

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ABSTRACT

This study focused on teaching methods used by grade 5 teachers in teaching addition of fractions in Khami District; Bulawayo Province. A qualitative research approach and case study design was employed while a purposive sampling technique was used to come up with six grade 5 teachers and three Head of Grades (HOGs) to participate in the study. Interviews and questionnaires were the two research instruments used to gather data from the respondents. Interviews were used in respect of grade 5 teachers and questionnaires were used in respect of HOGs in three selected schools in Khami District. Thematic analysis was then used to analyze the data. The major research findings were that teachers mostly use the demonstration and group work method when teaching addition of fractions; the study also revealed that teachers face challenges of managing classes with many learners and lack of teaching resources; it also emerged that teachers help grade 5 learners to understand addition of fractions by remediating slow learners during the lesson, using concrete teaching and learning media when teaching and engaging parents in their learning to ensure homework compliance and that staff developing teachers on how to teach addition of fractions can enhance their expertise on how to help grade 5 learners to understand addition of fractions.

LIST OF ACRONYMS

HOG – Head of Grades

MoPSE – Ministry of Primary and Secondary Education

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CHAPTER 1

INTRODUCTION TO THE STUDY

1.0 Introduction

Mathematics is a subject area that has held and is still holding a leading position among all other subject areas in the school curriculum at primary school level. In the same development, at primary school level mathematics is one of the compulsory subjects that all learners must learn. This makes mathematics one of the most essential subjects in the school curriculum. For that reason, it is crucial for teachers to lay a strong foundation of mathematics basics such as addition. Thus, no building of mathematics can be put up without the solid basic foundation of mathematics. Addition is one of the most important foundation blocks of mathematics and ones inability to do simple addition fails to climb the academic ladder of education to its topmost height. Therefore, comprehending fundamental principles is crucial for learners' future in mathematics.

However, the main gist of this research is to explore teaching methods used by Grade 5 teachers in teaching addition of fractions. Besides, the researcher also intends to analyze the effectiveness of teaching methods in teaching addition of fractions, identify the specific obstacles faced by learners in understanding addition of fractions, ways of improving understanding of fractions and to make necessary suggestions regarding the teaching methods which teachers can employ when teaching addition of fractions.

1.1 Background to the study

Fraction often represents the first hurdle experienced by primary school learners when learning mathematics because it is one of their first experiences with a mathematics concept beyond the basic skills of addition, subtraction, multiplication and division. Therefore, it is important that learners feel comfortable and confident in their understanding of fraction because the concept forms a building block for other mathematical skills. Researchers argue that children generally perform badly in algebra questions involving fraction and that knowledge of fraction is crucial

for success in algebra (Booth, Newton and Twiss-Garrity 2014). Norton and Boyce (2013) argued that fractions are very difficult to teach, most cognitively challenging and most essential for advanced mathematics.

In motivation of the above, the rationale for this study emerged from the researcher's personal experience. The researcher had the opportunity to help Grade 5 learners who were preparing for their End of Term Tests to revise mathematics. It was then that the researcher met these Grade 5 learners, interact and help solve certain pressing mathematics concepts. During that period, the researcher observed that, some learners were unable to add fractions. Few learners who were able to add fractions only paid attention to the final solution in symbolic form, betraying a very limited conceptual understanding of addition of fractions. When the Class Teachers and the previous Class Teachers were consulted, they all said that, much effort had been put in, in assisting the learners, but many learners still find grasping addition of fractions as a challenge. When the problem was identified, the researcher took it upon himself to explore teaching methods used by teachers in teaching addition of fractions.

1.2 Statement of the problem

The researcher had a chance to help Grade 5 learners to revise mathematics in preparation for their End of Term Tests. Upon careful observation during that period revealed that, the learners were unable to do simple addition of fractions. This generated some interest in the researcher delve into the root of the learners' inability to add fractions because fractions are a reasonably necessary basic math concept. The problem therefore necessitated a thorough investigation into their causes particularly focusing on teaching methods used by Class Teachers in teaching addition of fractions. Hence, this study.

1.3 Research questions

1. What are the most methods used by teachers in teaching addition of fractions at grade five level?
2. What are the challenges faced by teachers when teaching addition of fractions at grade five level?
3. How do teachers help grade five learners to understand addition of fractions at grade five level?

1.4 Assumptions of the study

- It is assumed that grade 5 teachers in Khami District teach mathematics.
- It is assumed that those who shall be asked to respond to interview questions and answer questionnaires will be willing to do so and that they will offer genuine answers to given questions.
- It is assumed that the interview guides and questionnaires, which are the research's data collection instruments and which the researcher believes shall be well constructed for the purpose, will be adequate to extract the information sought.
- It is assumed that information to be obtained from respondents will be accurate, relevant and can be relied on.
- It is assumed that there will be enough cooperation from the respondents

1.5 Significance of the study

To the researcher

The research may allow the researcher to gain essential experience in research techniques and also contribute to the student's knowledge and professional growth.

To the University

This research might add on to existing body of knowledge and might serve as a reference to students at Bindura University and other interested educational researchers to investigate further the problem in other parts of the country.

To the schools

The study might be important to primary schools in Khami District as they may learn and appreciate the significance of teaching addition of fractions at Grade 5 level.

To the teachers

The study may also benefit primary school teachers in Khami District by keeping them abreast on the effective teaching methods to employ when teaching addition of fractions as well as help them meet their professional growth and development needs.

1.6 Limitations of the study

Financial

The researcher faced financial problems in carrying out the research. Expenses emanated from the need to buy data bundles for accessing the internet to acquire more information regarding the study and travelling costs during data collection period. To counteract this limitation the researcher had to seek financial assistance from friends and relatives.

Time

The time for the research is limited since the researcher is a full time teacher who is expected to plan lessons for learners as well as to keep records for the class. In addition to that, the researcher was expected to carry extra and co-curricular duties like any teacher at the school. To counteract this limitation the researcher improved on time management by making a schedule to balance work and studies.

Data collection

Two of the school targeted in this research conduct hot-seating to serve as many children as possible with limited infrastructure. Therefore, half the school attends classes in the morning and the other half in the afternoon. As a result this brought about some limitations in soliciting data from research participants. To counteract the limitation the researcher resorted to making multiple visits to each school for appointments with the target participants.

1.7 Delimitations

This study explores teaching methods used by Grade 5 teachers in teaching addition of fractions in Khami District. The research will be carried out focusing on addition of fractions at Grade 5 level. It will involve Grade 5 Class Teachers and Heads of Grades.

1.8 Definition of terms

- **Teaching method** – is a strategy employed by teachers to impart knowledge and facilitate learning.
- **Teaching** - is a process by which a trained person imparts knowledge and help learners to understand particular concepts.
- **Addition** – is the process of adding two or more numbers together to find their totals.
- **Fraction** – is a number that represents a part of a whole, typically written as numerator divided by denominator.

1.9 Chapter summary

In this chapter the researcher focused on the background of the study, statement of the problem and research questions, assumptions, significance of the study, limitation of the study and study and definition of key terms. The next chapter focuses on literature review.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter reviews related literature on teaching methods in teaching addition of fractions. The chapter begins by defining the term fraction, presents a theoretical framework underpinning the study and proceeds to unveil relevant literature by other scholars. Much like a compass guiding a sailor, this chapter will be guided by relevant themes which are in tandem with research objectives.

2.1 Definition of a fraction

Bennett and Nelson (2017) define a fraction as numerical expressions representing a part or multiple portions of a whole. According to Zhang, Clements & Ellerton (2014) a fraction is a number value that defines part of a whole or group of objects. Brown (2016) defines a fraction as a component or sector of a given quantity taken from the whole which might be a number, a specified value or item. Therefore, a fraction can be defined as a number that represents a part of a whole, typically written as numerator divided by denominator.

2.2 Theoretical framework

This study will be guided by Bruner's Theory of Instruction. According to Fennell and Rowan (2015) Bruner was interested in how children represent their understandings. On a similar note, Fennell and Rowan (2015) further opines that Bruner developed different ways of thinking and called these ways of thinking modes of representation. He coined three modes which are: **(i)** enactive **(ii)** iconic and **(iii)** symbolic. In enactive mode, Bruner suggests the role of physical objects in learning. This mode deals with the use of some known aspects of reality without using words or imagination. Iconic mode refers to pictorial and graphic representations. This mode deals with the internal imagery where the knowledge is characterized by a set of images that stand for the concept. In symbolic mode, representation is based upon an abstract. It is characterized by the ability to use words and symbols. Therefore, the theory was basically used to explain how children represent their understandings and can thus be used in this study to explain how learners can better understand addition of fractions.

2.3 Bruner's Theory of Instruction in the context of teaching fractions

Bruner's Theory of Instruction is concerned with children having an understanding of concepts and underlying structures. This can be corroborated with teaching fractions. Thus, in enactive mode, Bruner suggests the role of physical objects in learning. In the context of teaching fractions, the teacher can bring real media such as oranges to explain the concept of part-whole interpretation and the additive operations of fraction. Thus, cutting the orange into two halves or four equal parts can help learners to understand the concept of fractions. Iconic mode refers to pictorial and graphic representations. In the context of teaching fractions, teachers can use pictorial media such as charts which shows pictorial representation of the concept of fractions. In symbolic mode, representation is based upon an abstract. In the context of teaching fractions, the teacher can use words so as to encourage the use of appropriate terms to use when computing fractions. Thus, teachers can emphasize correct verbalizations of numerical fraction symbols. For instance, stressing to learners that they should not verbalize the fraction $\frac{2}{4}$ as 'two over four' because, "over" means something that has gone past. Instead, learners should say 'two-fourth' or two out of four parts. Therefore, Bruner's Theory of Instruction aligns with the topic under study and can be used to underpin this study.

2.4 Importance of teaching fractions

Fractions provide the capacity to understand everyday life. Bennett and Nelson (2017) assert that fractions are a fundamental aspect of ordinary life, transcending their academic significance. Bennett and Nelson (2017) further opine that fractions are the foundation of numerous everyday calculations in our lives such as time: Time frequently uses fractions to express time: thirty minutes is $\frac{1}{2}$ of an hour and fifteen minutes is $\frac{1}{4}$ of an hour. Similarly, cooking and baking: recipes frequently call for fractional quantities, such as $\frac{1}{2}$ cup of sugar or $\frac{3}{4}$ cup of milk. This extensive application of fractions highlights the significance of mastering them, not only for their mathematical significance but also for the practical implications of this mastery. It must therefore be recognized that fractional knowledge and mastery is important in that its importance goes beyond mathematical computations and infiltrates in daily life.

Fractions are very crucial in that they extend to other subject areas. Thus, their significance extends to multiple mathematical disciplines. Fractions are central in algebra, geometry, calculus, probability and statistics (Thompson and Saldanha, 2018). They occupy the voids between integers on the number line and provide the continuity required for mathematical coherence and the development of mathematical theories and applications. Given this evidence it can be recognized that teaching fractions is important in that they play essential role in advanced mathematics.

2.5 Teaching methods used in teaching addition of fractions

Implementing effective teaching strategies is crucial to assisting students in overcoming the obstacles to learning fractions. One such method uses visual representations such as fraction bars, charts and number lines. These aides facilitate children's comprehension of fractions as numbers with magnitude. They provide a visual representation of fractions that corresponds to the concrete operational stage of a child's cognitive development (Fennell and Rowan, 2015). Thus, the teacher can display charts with drawings or pictures showing the concept of fractions. Boulet (2017) purports that charts enable children to learn during the instructor's absence. This gives a clear indication that charts can be used to create mathematics rich environment.

Using tangible manipulative materials such as fraction blocks or fraction circles is another effective teaching strategy. These provide a tangible representation of the relationship between parts and wholes, which can help children to better comprehend fractions. Learners can physically manipulate fractions with manipulative materials, strengthening the link between abstract mathematical concepts and their concrete representations. Thus, the teacher can make learners to interact with content as a group by giving learners concrete media to use during lesson presentation. Thus, as they discuss they will be in a better position to interact with the content. Koloff (2011) believes that concrete media help the teacher to deliver the lesson easily and at the same time shift the pattern of interaction from the teacher interacting with the learners to learners interacting with the content. It is clear therefore that concrete media is essential in simplifying fractions for learners.

Integration of fractions into real-world contexts is an additional effective teaching strategy. By presenting fractions in contexts such as cookery or handling money, children can relate the concept to their everyday lives (Carpenter et al., 2019). This makes fractions more relevant and enables children to appreciate the utility of fractions in solving real-world problems. This strategy is consistent with the contextual learning theory, which links learning to real-world experiences. Thus, when students recognize the practical application of fractions, they are more likely to retain and employ the information. It is clear therefore that teaching fractions in context helps reconcile the divide between classroom learning and practical application which in turn enhance the effectiveness and significance of the learning process.

Demonstration method is among other methods that are widely used when teaching subject areas such as mathematics. In this method, the teacher performs the experiment or works out a mathematical problem in the class explaining the processes involved. A study by Hackenberg and Lee (2015) reveals that the demonstration method takes into account the active participation of the learner. Hackenberg and Lee (2015) further opine that the learner sees the actual concrete objects and operations and helps the teacher in the demonstration. On this basis one can say that the demonstration method assists the learner understands and remembers what he or she is taught since learning is from concrete to abstract.

2.6 Challenges faced by learners when learning fractions

Learning fractions is a difficult process frequently accompanied by numerous obstacles and misunderstandings. The ‘whole number bias’, in which infants incorrectly interpret fraction notation as two distinct whole numbers rather than a single rational number, is one of the significant barriers (Ni and Zhou, 2015). This misconception can significantly hinder a child’s ability to execute fraction operations, undermining their fundamental understanding of fractions as a unit. It can therefore be inferred that in order to eradicate the hurdle of whole number bias teachers need to employ teaching strategies that helps learners to understand the correct interpretation of fractions.

The over-generalization of the rule that “larger numbers indicate larger values,” which applies to whole numbers, is the source of a second source of confusion. This concept is frequently applied to fractions by children, confusing the relative proportions of fractions. This misconception can

hinder a child's ability to compare or recognize equivalent fractions (Vamvakoussi and Vosniadou, 2020). On these bases it can therefore be recognized that teachers need to devise teaching methods that enable learners to understand general rules of fractions which will in turn help them gain a thorough conceptual understanding of fractions.

A study carried out by Mafa and Makufa (2016) in Zimbabwean primary schools on academic performance in learners, findings revealed that the major factor of poor academic performance in learners was that most parents were not actively and meaningfully engaged in their children's education. However, some studies have suggested that some children perform well academically regardless of parental engagement in their school activities (Mafa and Makufa (2016). Therefore, it is congruent to argue that active and meaningful engagement promotes academic performance in learners.

Another study by Chagonda (2019) reveals that the Zimbabwean economic crisis has not spared schools, which have to procure instructional resources to enable teachers to connect theory and practice. The study by Chagonda (2019) further reveals that the lack of textbooks in schools existed due to the financial constraints as a result of parents failing to pay fees for their children. Therefore, it is cogent to argue that the current prevailing economic upheavals in Zimbabwe results to some schools facing challenges to buy textbooks which may be used by teachers to connect theory and practice.

Another study conducted by Guta (2017) shows that the teacher to pupil ratio in most primary schools in Zimbabwe currently stands at 1:50 and in some extreme cases one teacher to 80 learners, a scenario which definitely compromises the quality of the end result. Therefore, it is cogent to argue that the teacher-learner ratio may hinder effective teaching which in turn affects learners in mastering concepts. This is generally because teachers may find it difficult to manage large classes during lesson presentations.

2.7 Chapter summary

In this chapter the term fraction was defined. The chapter also discussed on various opinions put forward by different scholars and authors regarding teaching addition of fractions at grade 5 level. The next chapter focuses on research methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This chapter focuses on the research paradigm, research approach, research design, population and sample, sampling procedures, data collection instruments, data collection procedures and data analysis as well as ethical considerations.

3.1 Research Paradigm

A research paradigm is very critical in research. According to Guba and Lincoln (2005), research paradigms are belief systems or worldviews that guide the researcher to make choices on the methods for the study, and also to understand the ontology (nature of reality) and the epistemology (the theory of knowledge) of the study in fundamental ways. These will be discussed in detail below in this section. Niewenhuis (2007) defines research paradigms as organising principles by which reality can be interpreted and as a set of assumptions about fundamental aspects of reality which results in a particular world-view. In this regard, a paradigm becomes a complete framework within which scientists operate, as it guides what evidence is collected, how it is collected, and how it should be analysed and explained. The four research paradigms noted by most researchers are: positivism/post-positivism; interpretivism/social constructivism; emancipatory/critical and pragmatism/post-modernism (Nieuwehus, 2007).

This study will be located within the constructivist paradigm. According to Nnachi (2009) the constructivist theory is basically a theory based on observation and scientific study about how people learn. Therefore, the constructivist is applicable to this study because the researcher intends to observe how teachers teach addition of fraction, the methods they use as well as understand the hurdles faced by learners when learning fractions.

3.1.1 Epistemology

Epistemology is the process of thinking which provides the relationship between what we know and what we see (Denzin and Lincoln, 2013). Through epistemological enquiries, the researcher will embrace the information, confirmation and motives for considering and justifying the possibility of what should be believed or if there is need for additional information. Therefore, in this study the researcher went in the field to get to know the participants and the nature of knowledge they have regarding teaching addition of fractions at grade 5 level.

3.1.2 Ontology

Creswell (2013) avers that ontology implies issues relating to the nature of reality and its characteristics. In other words, it denotes the science of existence and the nature of reality. Realities are shown to “exist in form of multiple mental constructions, socially and experimentally based, local and specific, dependent for their form and content on the persons who hold them. Ontologically, the researcher will made enquiries from the participants about their observations on teaching addition of fractions at grade 5 level. The contributions from the research participants were presented as multiple quotes based on the actual words of different individuals and presenting different perspectives from individuals. This revealed the reality on teaching addition of fractions at grade 5 level in the schools under study.

3.1.3 Axiology

Axiology connotes the role of the values and ethics in research (Creswell, 2013). Denzin and Lincoln (2013) refer to axiology as parts of philosophy relating to ethics, aesthetics and religion. By way of axiology, this study will present the researcher’s interpretations as much as those of the participants as well as recognise how ethics are embedded within the paradigms. The researcher acknowledged the ethical issues that encompass this research. Therefore, at every stage of this research ethical issues were considered.

3.2 Research Approach

This study followed the qualitative approach. Qualitative research is a means of exploring and understanding the meaning of individuals or groups ascribe to social or human problem (Hoberg, 2020). In the words of Baxter (2018, p.13), “unlike quantitative researchers, qualitative researchers do not want distance between themselves and their participants but want the opportunity to “connect with them at a human level”. The researcher used the qualitative approach because this research approach allows the researcher to connect with and capture rich information from research participants as well as to broaden his understanding regarding the teaching addition of fractions.

In motivation of the above, a qualitative approach might be suitable for this study since the researcher intends to interact with the participants, listen to them and attempt to make sense of their perceptions regarding teaching addition of fractions at grade 5 level. Qualitative inquiry can be interactive or non-interactive depending on the focus and nature of the study (Myers, 2013). Therefore, this study was dominantly interactive as it intended to gain insight on participants’ experiences and meanings by using appropriate research methods during data generation process. Baxter (2018), opines that “Qualitative researchers enjoy serendipity and discovery” and resonate to “the endless possibilities to learn more about people.” Therefore, the researcher adopted a qualitative research approach for this study because it uses an emic perspective, thus, it derives meaning from the research participants’ perspective.

3.3 Research Design

Research design is critical in research. According to Hancock, Ockleford and Winridge (2016) a research design is a detailed outline of how an investigation will take place showing how data is to be collected, research instruments to be used, how the instruments will be used and the proposed means for analyzing data collection. This study adopted the Case Study design. According to Yin (2011) a case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. The researcher used the case study design because this approach has the advantage of ensuring that the phenomenon is not explored through one lens, but rather a variety of lens which allows for multiple facets of the

phenomenon to be revealed and understood. Therefore, the case study design was suitable for this study since the focus of the study is inclined to real life experiences.

3.4 Population

According to Harper (2014) population is a group of individuals that have one or more characteristics in common that are of interest to the researcher from which the sample might be drawn. According to Creswell (2012, p. 142), “population is a group of individuals (or a group of organisations) with some common defining characteristic that the researcher can identify and study”. Therefore, population refers to an entire group of people that the researcher wishes to investigate. In this study, the population consists of all teachers in Khami District.

3.5 Sample

According to Cohen and Manion (2016) a sample is a group of people taken from a larger population containing the characteristics of a larger population. Maree (2013) defines a sample as the group of participants, selected carefully according to the purpose of the study. Therefore, a sample is a group of people taken from the population that the researcher wishes to investigate. In this study, the researcher will purposively select 6 teachers and 3 Head of Grades (HOGs) to participate in this study.

3.6 Sampling Procedure

Choosing research population is critical in research since it involves decisions on who should participate in the research. According to Kothari (2013) a sampling procedure is a process or technique of choosing a sub-group of individuals from a population to participate in the study. Maree (2013) defines a sampling procedure as the process used for selecting a portion of population with specific characteristics for study. Therefore, a sampling procedure is the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected. There are different ways of choosing participants which include purposive selection, random selection and convenient selection.

In this study, the researcher will apply purposive sampling procedure to sample all research participants. According to Harper (2014) purposive sampling procedure selects sample individuals based on their ability to yield rich information about the phenomenon under investigation. Purposive sampling constitutes the selection of information-rich cases (McMillan and Schumacher, 2010). Klein (2013) defines purposive sampling procedure is a non-probability sampling technique where the researcher relies on their discretion to choose variables for the sample population. Therefore, purposive sampling procedure that involves identifying and selecting individuals or groups of individuals based on their potential to give rich information related to the phenomenon under study. Thus, purposive sampling enables the researcher to handpick cases to be included in the sample on the basis of her judgment of their typicality. In this study the researcher identified and selected six grade 5 teachers and 3 HOGs from three selected schools in Khami District.

3.7 Data collection instruments

Data collection instrument are critical for research purposes. According to Sekeran and Bougie (2016) data collection instrument is tool used for gathering data. Silverman (2014, p.5) defines data collection instrument as a “tool which the researcher uses to gather data.” Therefore, a data collection instruments are tools used by researchers to collect data in research. Consistent with the qualitative research approach, the researcher will use questionnaires and in-depth interviews to gather data for this study. Questionnaires will be used in respect of teachers, in-depth interviews in respect of teachers. The prime reason for choosing three data collection instruments to gather data in this study is for triangulation. In the same vein, reasons for choosing each instrument are discussed in 3.7.1 to 3.7.2 below.

3.7.1 Questionnaires

Maree (2013) defines a questionnaire as a set self-report data collection instrument that each research participant completes as part of a research study. According to Kahn and Cannell (2014) a questionnaire is a set of carefully constructed questions designed to provide systematic information on a particular subject. Therefore, a questionnaire is a data collection tool with a set of questions drafted by the researcher for the purpose of soliciting data on a particular subject from research participants.

In addition to the above, HOGs answered the questions in written form using their own words, revealing their thoughts, providing answers which fell within their frame of reference and gave the reasons were necessary for their responses. Kahn and Cannell (2014) believe that questionnaires allow research participants more time to respond to the questions. Kahn and Cannell (2014) further affirm that data gathered from questionnaires is easily put into useful information. Questionnaires are the most widely used technique for obtaining information from research participants because they are relatively economical, have same questions for all subjects and can ensure anonymity (McMillan and Schumacher, 2010). Therefore, questionnaires used in this study had short descriptions declaring the purpose of the study and anonymity procedures.

3.7.2 In-depth interviews

According to Harrell and Bradley (2019), in-depth interviews can be used as a primary data gathering method to collect information from individuals about their own opinions, past or present experiences. Hancock, Ockleford and Winridge (2016) observe that an in-depth interview is a free-flowing conversation and involves a number of open ended questions based on the topic areas that the researcher wants to cover. Therefore, in the context of this study an in-depth interview is a purposeful discussion between two people on a subject of common interest.

In-depth interviews are critical in research, because in the event that the interviewee happens to have difficulty in answering a particular question or provides on a brief response, the interviewer will be in a position to use cues or prompts to encourage the interviewee to consider the question further. In in-depth interviews, the interviewer directs the interview more closely and also has the freedom to probe the interviewee to elaborate on an original response or to follow a line of inquiry introduced by the interviewee (Harrell and Bradley, 2019). According to Gray (2004), probing is a way for the interview to explore new paths which were not initially considered. Hancock, Ockleford, and Winridge, (2016) share the same idea that the conversation might take an unanticipated direction which can provide an opportunity for identifying new ways of seeing and understanding the topic at hand (Hancock, Ockleford, and Winridge, 2016). Therefore, in this study in-depth interviews were used to tap into teachers' past and present experiences of teaching addition of fractions at grade 5 level.

3.8 Data Collection Procedures

According to Marshall and Rossman (2016) data collection procedure is the systematic approach to gathering and measuring information from a variety of sources to get a complete and accurate picture of an area of interest. Fraser (2015) defines data collection procedure as a methodical process of gathering specific information to proffer solutions to relevant research questions. Therefore, data collection procedure is the process of collecting information from all the relevant sources in order to find answers to the research problem. In this study, the researcher collected data by means of hand administering questionnaires to HOGs and conducting face-to-face interviews with grade 5 class teachers.

3.9 Data Analysis

According to Silverman (2014) data analysis is the interpretation of data gathered through the use of analytical and logical reasoning to determine patterns, relationships or trends. Fraser (2015) defines data analysis as the science of examining a set of data to draw conclusions about the information to be able to make decisions. Therefore, data analysis is the process of inspecting data in order to extract useful information from it.

On a similar development, content analysis method will be used to analyse data from and questionnaires, interviews and FDGs. Marshall and Rossman (2016) observe that researchers conduct content analysis on written documents to explore the coverage of particular themes. Maree (2013) opines that the aim of qualitative data analysis is to interpret and make sense of what is in the data. In this study, the following steps were taken during the process of data analysis:

- 1.** Conducting the in-depth interviews and hand administering questionnaires
- 2.** Unitizing the data and making a list of main ideas, words and phrases.
- 3.** Making a list of main ideas.

3.10 Ethical Considerations

Ethics are imperative and the most important aspect that needs to be considered when undertaking a research. Marshall and Rossman (2016) define ethical consideration as a collection of principles and values that the researcher should followed while conducting research. In this research the researcher will observe the following ethics: Informed and Voluntary Consent, privacy and Anonymity, No harm to participants, Voluntary Participation and the Right to Withdraw from the Study at Any Time, Confidentiality, Clearance from the Ministry of Primary and Secondary Education Research Innovation and Development department, Publication of findings and feedback to research participants.

Informed and Voluntary Consent

The researcher will inform the participants on the purpose of the study, who is researching it, how the findings might be used and who have access to the findings so that they make an informed decision. According to Latiff (2016), researchers are expected to obtain informed consent from all those who are directly involved in research or in the vicinity of research. This principle adheres to a larger issue of respect to the participants so that they are not coerced into participation and have access to relevant information prior to the consent. Latiff (2016) states that consent is usually obtained through written consent forms, and necessary elements of consent are identified by the review committees and in the consent forms prior information on key elements of research purpose, procedures, time period, risks, benefits, and a clause stipulating that participation is voluntary and that the participants have the right to withdraw from the study is included. Participants in this study will be enlightened on the informed and voluntary consent and that this study does not have any financial rewards to it.

Privacy and Anonymity

This principle is concerned with offering respect and protection to research participants through assurance of confidentiality of information shared and anonymity by not revealing the identity of the individuals and institutions involved (Rossman, 2016). Pseudonyms will be used to protect the identities of the research participants. They will also be informed of their anonymity in the data compilation and report writing of the study. However, the participants' identities will not

anonymous to the researcher and her supervisor. The participants will be informed of this fact before completing questionnaires, conducting the interviews or engaging in focus group discussions.

No harm to participants

This principle expects researchers to provide participants with an outline of the risks and benefits involved to the participants in the study (Halai, 2016). The principle adds that there should be a reasonable expectation by research participants that they were not be involved in any situation in which they might be harmed. Therefore, in this study the researcher will explain to the participants that the process will not in any (unintended or otherwise) involve them in any situation in which they might be harmed.

Voluntary Participation and the Right to Withdraw from the Study at Any Time

Voluntary participation means that participants should take part in the study willingly and should also be free to withdraw from the study as and when they wish to at any time. Wilkins (2013) opines that the research participants should be informed of the option to withdraw from the research at any time if they so wish and that they can do so without giving any justification to the researcher. Latiff (2016) observes that in the era of digital technologies, besides withdrawing from the study while it is being conducted, participants need to know that they can choose to withdraw once data collection is finished. Participants need to be able to withdraw after reviewing recordings or edited versions of the data. They need to be able to withdraw (or have the data withdrawn) from websites or other distribution media if they feel threatened or exploited (Maree, 2013). Therefore, in this study the researcher didnot coerce participants instead he encouraged willing participants to freely engage on agreeable terms with the researcher.

Confidentiality

Safeguarding the information solicited from research participants is critical in research. Fulfilling the ethical duty of confidentiality is essential to the trust relationship between researcher and participants and to the integrity of the research project (Putton, 2011). Therefore, in this research the researcher explained to the participants that all the information that they will avail in a confidential manner will not be availed to anyone else.

Publication of findings and feedback to research participants

The researcher clarified to the participants that the final electronic copy of the research report with the findings of the study will be availed to them should they choose to have it as soon as the study is complete. According to Wilkins (2013), the final research report should be made available to the research participants if and when they so request it. The researcher assured the participants that the final electronic copy of the research report with the findings of the study will be availed to them should they choose to have it as soon as it is complete.

Clearance from the Institutional Ethics Committee

Permission to conduct this study will be obtained from the Ethics Committee. The researcher will obtain a Standard Letter from the Ethics Committee to proceed to work on their Dissertation as part of the academic requirements for the Bachelor of Science Education Honours Degree in Mathematics. This Standard Letter was used as the basis to conduct this study involving human participants.

3.11 Chapter Summary

This chapter focused on the research paradigm, research approach, research design, population and sample, sampling procedures, data collection instruments, data collection procedures and data analysis. It also presented ethical considerations and concludes with a chapter summary. The next chapter focuses on data presentation, interpretation and discussion.

CHAPTER 4

DATA PRESENTATION, INTERPRETATION AND DISCUSSION

4.0 Introduction

The previous chapter focused on research methodology. This chapter focuses on data presentation, interpretation and discussion pertaining to the data collected from research participants. Data will be presented and interpreted using the question by question approach. Discussion will be concomitantly done under each question. Quotes will be extensively used to provide a qualitative “feel” of the responses. Only quotes representing common, rather than idiosyncratic responses will be used. The discussion is guided by the research questions which are in tandem with the research objectives. For anonymity and confidentiality, pseudonyms were used as follows:

Teacher 1: Mr Gava; **Teacher 2:** Mr Moyo; **Teacher 3:** Mr Ncube; **Teacher 4:** Mrs Cele;

Teacher 5: Mrs Khoza; **Teacher 6:** Mrs Dube

4.1 Findings from Interviews with Grade 5 teachers

Question1: What do you understand by the term fraction?

Responses by teachers relating to their understanding of the term fraction clearly reflected that teachers had a better understanding of the term fraction. Thus, they did not struggle to articulate the terms. Below are the responses from six class teachers who were interviewed.

Mr Gava

“Well, a fraction is part of a whole”

Mrs Cele

“These are numbers which represents the parts of a whole.”

Mr Ncube

“Is a number written as a ratio of two integers separated by the solidus.”

Mr Moyo

“Is a number that results from dividing one whole number by another.”

Mrs Khoza

“Basically, a fraction is a number expressed as a quotient, in which the numerator is divided by the denominator.”

Mrs Dube

Is a number which has two parts, one on the top and the other on the bottom. The number on the top is the numerator and the number at the bottom is called the denominator.”

Discussion

It is pellucid from the above definitions that teachers in Khami District were aware of the term fraction because each teacher managed to give a simple definition of the term fraction. These responses were also clear and confident answers which did not betray their lack understanding of the concept of addition of fractions. On these bases, it is cogent to argue that their understanding and appreciation of the term fraction point to the fact that teachers were knowledgeable about teaching addition of fractions at grade 5 level.

Question 2: In your opinion, what do you think is the importance of teaching addition of fractions at Grade 5 level?

Data gathered through the interviews show that the majority of teachers believe that teaching of addition of fractions at grade 5 level is important. Responses by all the teachers were positive and reflected that teaching addition of fractions is indeed important at grade 5 level. Below are responses by six class teachers who were interviewed.

Mrs Khoza said that:

“Thank you for asking that question. I think that the prime importance of teaching the addition of fractions at grade 5 level is that it lays the foundation for

advanced mathematical concepts...thus, teaching addition of fractions ensures that learners develop a strong mathematical foundation.”

Mr Ncube aptly said:

“...teaching learners how to add fractions is important because it helps them apply mathematical concepts to real-life situations which in turn enhance their problem solving skills...basically the concept of fractions and addition is used in everyday life.”

Mr Gava articulated that:

“...teaching learners how to add fractions is important because it encourages learners to think critically and logically...let me give you an example, when learners are learning how to add fractions they get to analyse the problems presented to them and determine the best approach to find the solutions.”

Mrs Dube succinctly said:

“...it is public knowledge that learning involves interaction, thus the interaction can be between learners thus, learner to learner or teacher to learner interaction. This interaction promotes collaboration and communication which in turn also helps them sharpen their social skills. So teaching addition of fractions at grade 5 level is important in that learners learn how to gel and communicate with their fellow learners or their teacher.”

Mrs Cele also said:

“...teaching addition of fractions at grade 5 level helps learners to develop a better understanding of number sense....once learners understand numbers and their relationships, learners will not have any challenges in solving mathematical problems...”

Mr Moyo articulated that:

Mathematics is a challenging subject for most learners. Therefore, teaching addition of fractions helps learners with persistence and resilience because working through challenging concepts teaches builds resilience which is an important trait for academic success, because for learners to pull through their studies they need resilience.”

Discussion

It is lucid from the above quotes that teaching addition of fractions at grade 5 level is important. The literature lends credence to these findings. A study by Bennett and Nelson (2017) assert that fractions are a fundamental aspect of ordinary life, transcending their academic significance. Bennett and Nelson (2017) further opine that fractions are the foundation of numerous everyday calculations in our lives such as time: Time frequently uses fractions to express time: thirty minutes is $\frac{1}{2}$ of an hour and fifteen minutes is $\frac{1}{4}$ of an hour. Similarly, cooking and baking: recipes frequently call for fractional quantities, such as $\frac{1}{2}$ cup of sugar or $\frac{3}{4}$ cup of milk. This extensive application of fractions highlights the significance of mastering them, not only for their mathematical significance but also for the practical implications of this mastery. It must therefore be recognized that teachers in Khami District emphatically believe that fractional knowledge and mastery is important in that its importance goes beyond mathematical computations and infiltrates in daily life.

Question 3: Which methods do you use when teaching addition of fractions at Grade 5 level?

During the interviews teachers raised a number of teaching methods. Among others were demonstration, group work, peer teaching and the explanation teaching method. Be that as it may, the demonstration method was frequently mentioned. Below are the responses by participants:

Mr Ncube said:

“...I use the demonstration method...as for me I prefer models such as fraction circles or fraction bars which visually represent fractions. I like models because I

can use them for demonstration and at the same time learners can manipulate them and be engaged in their own learning.”

Mr Moyo said:

“...Demonstration is the best teaching method for teaching concepts such as fractions. For that reason, thus the method I use when teaching fractions. For example, I can use real media such as apples or oranges and then demonstrate how they can be shared among two or four people.”

Mrs Cele articulated that:

“...I always use the demonstration method because it is the only method that helps all students to understand the concept better regardless of their academic ability. Let me give you a good example of a classroom set up, in a class you can have gifted, talented and slow learners. So cater for all learners, the demonstration methods stands out as the best method...”

Mr Gava aptly said:

“...I’m an Inclusive education specialist and my teaching is more inclined to inclusive teaching methodologies. So to answer your question, I use the explanation method to learners who are quick to grasp concepts, demonstration method to learners who struggle to master the concept and sometimes real life scenarios to learners who perform exceptionally well in their school work. I do that so that I move away from uniform teaching and provide tailored teaching and learning that accommodate specific individual needs of learners.”

Mrs Khoza said:

“I employ the group work method. I organize learners into small groups to solve mathematical problems...I believe that learners should share knowledge among themselves.”

Mrs Dube said:

“...I use two methods which are peer demonstration and group work method. These two work best for me because the demonstration method allows one to drive the learners into understanding the concept in a realistic manner and after demonstration one can engage learners in group activities....basically, these two methods promote collaboration and critical thinking among learners...”

Discussion

It is clear that data gathered through the interviews show that the majority of teachers in Khami District use the demonstration method. Thus, (N=4 or 67%) said they employ the demonstration method when teaching addition of fractions. Only (N=2 or 33%) of the participants said they use group work method when teaching addition of fractions. Generally, this means that most teachers use the demonstration method when teaching addition of fractions. Literature confirms these findings. A study by Koloff (2011) reveals that concrete media help the teacher to deliver the lesson easily and at the same time shift the pattern of interaction from the teacher interacting with the learners to learners interacting with the content. On this basis, it is cogent to say that demonstrating using concrete media helps learners to understand the concept of addition of fractions better.

Question 4: What are challenges faced by Grade 5 learners in learning addition of fractions?

During interviews teachers raised a number of challenges faced by Grade 5 learners in learning addition of fractions. Teachers cited the following challenges:

Mrs Dube said:

“...personally I usually improvise media when teaching the concept of fractions because the school doesn't have textbooks and this becomes a challenge to learners because media is used during lesson presentation but textbooks can be used for reference purpose even after the lesson or after some days or weeks after learning the concept...”

Mr Gava said:

“...the main challenge is that shortage of learning materials such as textbooks...textbooks are not enough for learners”

Mrs Moyo succinctly put it:

“...how can learners master concepts without textbooks?...schools should buy textbooks for these learners. So to answer your question, the challenge is that they don't have resources.

Mrs Khoza articulated that:

“I think the prime challenge among all other challenges is the shortage of learning resources.”

Mrs Cele aptly said:

“...the challenge is that there are no textbooks in schools. Thus the reason why these learners find it difficult to master concepts taught.”

Mr Moyo said:

“...the elephant in the room are resources. We cannot say learners are facing challenges in understanding addition of fractions when they don't have resources to use...it's like judging a worker for failing to perform his duties when you didn't give that worker tools to use...?”

Mr Ncube articulated that:

“...as long as there is a shortage of teaching and learning resources, there will be no meaningful teaching and learning. There is a serious shortage of textbooks in schools.”

Discussion

It emerged from the data collected that (N=3 or 100%) mentioned that the main challenge faced by Grade 5 learners in learning addition of fractions is the shortage of learning resources such as textbooks. This gives a clear indication that there is a lack of teaching resources particularly textbooks in Khami District. The literature confirms these findings. A study by Chagonda (2019) reveals that the Zimbabwean economic crisis has not spared schools, which have to procure instructional resources to enable teachers to connect theory and practice. Therefore, one can safely say that the current prevailing economic upheavals in Zimbabwe results to some schools facing challenges to procure teaching resources such as textbooks.

Question 5: How can you counteract challenges faced by Grade 5 learners in learning addition of fractions?

Teachers mentioned that mounting school based workshops for teachers and parental engagement can be solutions to counteract challenges faced by Grade 5 learners in learning addition of fractions. Below are responses by teachers.

(a) Staff development workshops for teachers

Mr Gava said that:

“...I think the school should consider in-school staff training programmes in order to equip teachers with the necessary skills and knowledge on how to teach mathematical concepts such as fraction can be a solution to counteract challenges faced by grade 5 learners in learning addition of fractions.”

Mrs Khoza said:

“...conducting school based workshops is the solution...thus, school based workshops can help teachers to share knowledge on methods of teaching and activities to engage learners during lesson presentation...”

Mr Moyo articulated that:

“...staff developing teachers is the only solution to solve the challenge associated with challenges faced by grade 5 learners in learning addition of fractions.”

Mr Ncube aptly said:

“...some teachers lack the necessary skills and knowledge on how to teach mathematical concepts. Therefore, for that reason there is need for school based staff development workshops...”

Mrs Dube said:

“...schools should organize workshops because some teachers lack knowledge on how to teach mathematical concepts...”

Mrs Cele succinctly said:

“...as for me I’m a music teacher, I specialized in music, thus my domain of specialization and I didn’t receive any training on teaching mathematics related concepts, so the only solution to help teachers who are incapacitated like me is to attend seminars or workshops specifically for teaching mathematical concepts.”

(b) Teaching and learning media

Mrs Dube articulated:

“...to counteract challenges faced by grade 5 learners in learning addition of fractions teachers should use concrete media such as charts when teaching addition of fraction because charts help learners to visualize fractions...”

Mr Ncube aptly said:

“...I think that the challenge can be addressed by using media such as charts to illustrate fraction concepts...”

Mrs Cele said:

“...using teaching and learning media such as models and charts during lesson delivery can be a solution to counteract challenges faced by Grade 5 learners in learning addition of fractions. ...”

Mrs Moyo said:

“...the only solution to counteract the challenge is to use media when teaching the concept of addition of fractions. ...”

Mrs Khoza said:

“...learners should be engaged in their own learning and the only way to engage them is to present them with learning media such as models ...”

Mr Gava said:

“...media should be used...teachers should avoid standing in front of learners explaining the concept of fractions without media...”

(c) Parental engagement and homework compliance

Mr Gava said:

“...some parents don't bother themselves to help their children with homework...I believe that parental involvement foster a positive relationship between parents and teachers which would result in teachers being more inclined to help learners.

Mrs Moyo said:

“...If parents engage themselves in the education of their children by helping them with homework. Teachers will have increased work motivation which in turn impacts the academic performance of learners...”

Mrs Dube articulated that:

“Parental involvement is an indicator that parents are also concerned about the education of their children...some learners face challenges with mathematical concepts because they are not getting any assistance from parents at home.

Mr Ncube said:

“...homework compliance positively impacts the academic performance of learners. For that reason parents should be engaged in the learning of their children.”

Mrs Khoza said:

“When we work together with teachers, we are bound to understand each other, respect each other and trust each other. This will no doubt result in children’s performance getting better.”

Mrs Cele:

“...I believe that if parents are engaged in their children’s’ learning and help them with their homework they are highly likely to excel in their learning...why am I saying so, because parental engagement enhances communication between the teacher and parent, which in turn helps both the teacher and the parent to monitor the academic progress of learners.”

Discussion

It emerged from data gathered through the interviews that the majority of teachers believe that mounting school based workshops and parental engagement can be solutions to counteract challenges faced by grade 5 learners in learning addition of fractions. Be that as it may, the two main suggested solutions by teachers counteract challenges faced by grade 5 learners in learning addition of fractions betray the fact that schools in Khami District are not mounting school based workshops for teachers and that parental involvement in learning on their children especially on homework compliance is very low. The literature lends credence to these findings. A study

carried out by Mafa and Makufa (2016) in Zimbabwean primary schools on academic performance in learners, findings revealed that the major factor of poor academic performance in learners was that most parents were not actively and meaningfully engaged in their children's education. However, some studies have suggested that some children perform well academically regardless of parental engagement in their school activities (Mafa and Makufa (2016). Therefore, it is congruent to argue that active and meaningful engagement can be a solution to counteract challenges faced by grade 5 learners in learning addition of fractions.

4.2 Findings from questionnaires

For anonymity and confidentiality, pseudonyms were used as follows:

School A: HOG 1; **School B:** HOG 2; **School C:** HOG 3

1. (a). Which method do you usually use when teaching addition of fractions at grade five level?

Table 1: Teaching Methods

Teaching Method	Number	Total	
		Number	%
Demonstration	2	2	67%
Lecture method	-	-	-
Classroom collaboration	-	-	-
Peer teaching	-	-	-
Group Discussion	1	1	33%
Other method	-	-	-
		3	100%

Table 1 above indicate that (N=2 or 67%) of the respondents use the demonstration method while (N=1 or 33%) of the respondents use the group discussion method when teaching addition of fractions at grade 5 level. It can therefore be inferred that the demonstration method is broadly used as a teaching method when teaching addition of fractions at grade 5 level in Khami District. None of the respondents use the lecture method, classroom collaboration, peer teaching method as well as other methods when teaching addition of fractions.

Discussion

Head of Grades (HOGs) gave responses which were to some extent consistent with teachers' responses. Prominent in their responses were two main teaching methods when teaching addition of fractions, which are demonstration and group discussion method. Literature illuminates these findings. A study by Hackenberg and Lee (2015) reveals that the demonstration method takes into account the active participation of the learner. Hackenberg and Lee (2015) further opine that the learner sees the actual concrete objects and operations and helps the teacher in the demonstration. On this basis one can say that the demonstration method assists the learner understands and remembers what he or she is taught since learning is from concrete to abstract.

(b) Which teaching method do you think is the most effective in teaching addition of fractions at grade 5 level?

Table 2: Most effective teaching method

HOGs	Method	Total	
		Number	%
HOG 1: School A	Demonstration	1	33.3%
HOG 2: School B	Demonstration	1	33.3%
HOG 3: School C	Demonstration	1	33.3%
		3	99.9%

Table 2 above shows that (N=3 or 100%) of the respondents indicated that the demonstration method is the most effective method in teaching addition of fractions at grade 5 level. None of the respondents mentioned any teaching method besides the demonstration method. It is clear therefore that, the demonstration method is widely used by teachers in teaching addition of fractions.

Discussion

It is clear from the above table showing responses by HOGs on the most effective method in teaching addition of fractions at grade 5 level that among other teaching methods, the demonstration method stands out as most effective one. The literature confirms these findings. A study by Hackenberg and Lee (2015) reveals that the demonstration method takes into account the active participation of the learner. Hackenberg and Lee (2015) further opine that the learner sees the actual concrete objects and operations and helps the teacher in the demonstration. It is clear therefore that teachers in Khami District use the demonstration method in teaching mathematics concepts such as addition of fractions.

(c) What resources do you use when teaching addition of fractions at grade five level?

Table 3: Teaching resources used by teachers

Teaching Resource	Total	
	Number	%
Charts showing drawings of fraction	2	67%
Concrete Media	1	33%
	3	100%

Table 3 above indicates that (N=2 or 67%) of the respondents use charts showing drawings of fractions, while (N=1 or 33%) use concrete media when teaching addition of fractions at grade 5 level. Given this evidence, it is clear therefore that charts showing drawings of fractions and concrete media are extensively used by teachers in Khami District.

Discussion

It is lucid from the above table that charts and concrete media are pervasively used when teaching addition of fractions at grade 5 level in Khami District. The literature lends credence to these findings. A study by Fennell and Rowan (2015) reveals that the use of visual representations such as fraction bars, charts and number lines provide a visual representation of fractions that corresponds to the concrete operational stage of a child's cognitive development. Another study by Kollof (2011) reveals that concrete media help the teacher to deliver the lesson easily and at the same time shift the pattern of interaction from the teacher interacting with the learners to learners interacting with the content. On these bases, it can therefore be inferred that charts and concrete media can be used as teaching resources when teaching addition of fractions.

(d) How often do you use the method mentioned in (a) above?

Table 4: Frequency of using the teaching method

HOGs	Method	Frequency	
		Regularly	Occasionally
HOG 1: School A	Demonstration	✓	
HOG 2: School B	Demonstration	✓	
HOG 3: School C	Demonstration	✓	

Table 4 above shows how frequently the teachers use the methods they mentioned in question 1. (a). All the respondents, thus (N=3 or 100%) indicated that they use the demonstration method regularly when teaching addition of fractions.

Discussion

It emerged from data gathered through the interviews that the majority teachers use the demonstration method regularly. This may be because the method is applicable to many mathematics concepts. In the same vein, this may be because the method caters for both slow and fast learners. Literature confirms these findings. A study by Hackenberg and Lee (2015) reveals that the demonstration method takes into account the active participation of the learner. Therefore, it is cogent to argue that teachers regularly use the demonstration method because the method promotes involvement of learners in their learning.

2. (a). Which teaching method are you familiar with?

Table 5: Familiar teaching methods

HOGs	Teaching Method
HOG 1: School A	Demonstration; Discussion; Group work Peer teaching, Explanation
HOG 2: School B	Explanation, Demonstration; Games; Group work
HOG 3: School C	Inquiry based; Collaborative Learning; Demonstration; Problem based, Explanation

Table 5 above clearly indicates teaching methods which are familiar to HOGs. The most familiar teaching approaches stated by HOGs are demonstration; group work and explanation teaching method.

Discussion

What stands out from the HOGs responses is that teachers are familiar with three main teaching methods. Thus, (N=3 or 100%) mentioned the demonstration, explanation and group work methods of teaching. This gives a clear picture that teachers in Khami District broadly use the demonstration, explanation and group work methods of teaching in teaching addition of fraction at grade 5 level. This may be because when they are demonstrating the concept of fraction there is need for an explanation and after demonstrating and explaining they engage learners in group work activities.

(b) What difficulties are you facing when choosing a teaching method?

Table 6: Difficulties faced when choosing a teaching method

HOGs	Difficulties faced when choosing a teaching method
HOG 1: School A	Large class sizes; availability of resources
HOG 2: School B	Large class sizes; time constraints; learning styles, teaching and learning resources
HOG 3: School C	Large class sizes; resource availability;

Table 6 shows difficulties faced by teachers when choosing a teaching method. Two main difficulties were cited by HOGs, thus (N=3 or 100%) cited that large class sizes (class with many learners and availability of resources (teaching and learning media) while (N=1 or 33%) cited time constraints as a difficulty when choosing a teaching method.

Discussion

What is notable from the HOGs responses is that teachers are facing two main challenges when choosing a teaching method. Thus, (N=3 or 100%) mentioned that classroom composition (class with learners with different learning abilities) and availability of resources (teaching and learning media) as the main challenge when choosing a teaching method, while only (N=1 or 33%) cited time constraints as a challenge when choosing a teaching method. This shows that schools in Khami District have large class sizes which in turn make it difficult for teachers to choose the best teaching method. Literature lends credence to these findings. Another study conducted by Guta (2017) shows that the teacher to pupil ratio in most primary schools in Zimbabwe currently stands at 1:50 and in some extreme cases one teacher to 80 learners, a scenario which definitely compromises the quality of the end result. Therefore, it is cogent to argue that the teacher-learner ratio may hinder effective teaching which in turn affects learners in mastering concepts because teachers may find it difficult to manage large classes during lesson presentations.

(c) Do you have/use adequate teaching resources?

Table 7: Availability of teaching resources

Question: Do you have/use adequate teaching resources?	Yes	No
HOG 1: School A		✓
HOG 2: School B		✓
HOG 3: School C		✓

Table 7 above shows that (N=3 or 100%) of the respondents indicated that teaching resources are inadequate. This points out to the fact that teachers in Khami District are facing challenges when teaching concepts such as addition of fraction due to inadequate teaching resources.

Discussion

It emerged from the data gathered that there is a lack of teaching resources in Khami District. The literature confirms these findings. A study by Chagonda (2019) reveals that the Zimbabwean economic crisis has not spared schools, which have to procure instructional resources to enable teachers to connect theory and practice. Therefore, one can safely say that the current prevailing economic upheavals in Zimbabwe results to some schools facing challenges to procure teaching resources such as textbooks.

(d) If yes/no in (c) above give an explanation.

Table 8: Explanation on the availability of teaching resources

If yes/no in (c) above give an explanation	Yes	No	Explanation
HOG 1: School A		✓	The school does not provide
HOG 2: School B		✓	Not provided by the school
HOG 3: School C		✓	The school does not supply

Table 8 above shows that (N=3 or 100%) of the respondents indicated that schools do not provide them with teaching resources. This shows that schools in Khami District do not have adequate teaching resources.

Discussion

Data gathered reflects that there is a lack of teaching resources in Khami District schools. The literature illuminates these findings. A study by Chagonda (2019) reveals that that the lack of textbooks in schools existed due to the financial constraints as a result of parents failing to pay fees for their children. Therefore, one can safely say that schools can only be in a better position to supply teaching materials such as textbooks for both teachers and learners when parents pay school fees for their children.

3. (i). Do you have slow learners?

Table 9: Slow learners

Question: Do you have slow learners?	Yes	No
HOG 1: School A	✓	
HOG 2: School B	✓	
HOG 3: School C	✓	

Table 9 above shows that (N=3 or 100%) of the respondents indicated that they have slow learners in their schools.

(ii). How do help the slow learners to catch up with others?

Table 10: Ways of helping slow learners to catch up

Question: How do help the slow learners to catch up with others?	Explanation
HOG 1: School A	On the spot remediation
HOG 2: School B	Remediation during the lesson
HOG 3: School C	Instant remediation

Table 10 above indicates that (N=3 or 100%) of the respondents provide instant remedy to help slow learners to catch up with others.

(ii). How do you group your learners, mixed ability grouping or ability grouping?

Table 11: Grouping system

Question: How do you group your learners, mixed ability grouping or ability grouping?	Mixed ability	Ability grouping?
HOG 1: School A	✓	
HOG 2: School B		✓
HOG 3: School C	✓	

Table 11 above indicates that (N=2 or 67%) of the respondents group learners with varying learning abilities (mixed ability), while (N=1 or 33%) of the respondents group learners based on their learning ability (ability grouping).

(iii). Do you offer remediation during lesson or after remediation?

Table 12: Time for remediation

Question: Do you offer remediation during lesson or after remediation?	During	After
HOG 1: School A	✓	
HOG 2: School B	✓	
HOG 3: School C	✓	

Table 12 above indicates that (N=3 or 100%) of the respondents provide remediation during the lesson.

Discussion

It emerged from the data collected that (N=3 or 100%) of the respondents indicated that they have slow learners in their schools. This shows that schools in Khami District have slow learners. Similarly, (N=3 or 100%) of the respondents indicated that they provide instant remedy to help slow learners to catch up with others. This shows that schools in Khami District take a similar approach of assisting slow learners. Therefore, one can safely say that immediate correction helps slow learners not to lag behind in mastering concepts such as addition of fractions. In the same vein, (N=2 or 67%) of the respondents indicated that they group learners with varying learning abilities (mixed ability), while (N=1 or 33%) of the respondents group learners based on their learning ability (ability grouping). Given this evidence, it is clear therefore that schools in Khami District use mixed ability grouping system when grouping learners. This may be because mixed ability grouping system fosters collaboration among learners with different learning abilities while promoting a more inclusive classroom environment. Correspondingly, (N=3 or 100%) of the respondents pointed out that they provide remediation during the lesson. This clearly shows that schools in Khami District provide immediate remediation during the lesson to help slow learners to reach the same level with fast learners. It can therefore, be inferred that timely correction help slow learners to keep pace with fast learners in grasping the concepts.

4.3 Chapter summary

In this chapter data relating to teaching addition of fractions at grade 5 level was presented and interpreted using the question by question approach. Discussion was concomitantly done under each question. The following chapter summarizes key research findings and outlines conclusions and recommendations of the study.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMENDATIONS

5.0 Introduction

This chapter focuses on the summary of all the chapters, the findings, conclusions and recommendations of the study. It presents findings based on the discussion done, draws conclusions based on the findings and offers recommendations drawn from the conclusions of the study. The chapter also presents areas for further research.

5.1 Summary

The focus of this study was on teaching addition of fraction at grade 5 level in Khami District in which the respondents were six class teachers and three Head of Grades. The research commenced with chapter one which introduced the subject matter of the study by outlining the key areas namely background to the study, statement of the problem, research questions, assumption of the study, and significance of the study and limitations of the study. The delimitations of the study were highlighted while the definition of key terms marked off the chapter.

The review of related literature marked the beginning of chapter two which gave detailed literature on fractions. The literature was presented with relevant thematic headings drawn from research questions. The thematic headings used were: Importance of teaching fractions; Teaching methods used in teaching addition of fractions; Challenges faced by learners when learning fractions. Lastly, a chapter summary was presented marking the end of the chapter.

Chapter three outlined the methodology. A qualitative approach and a case study design were employed. The population comprised teachers and Head of Grades in which the respondents were six grade 5 class teachers and three HOGs. Data was collected using two instruments which were interviews and questionnaires. A chapter summary marked the end of the chapter.

Thereafter, chapter four focused on data presentation, interpretation and discussion pertaining to the data collected from research participants. Data was presented and interpreted using the question by question approach. Discussion was concomitantly done under each question. Quotes were extensively used to provide a qualitative “feel” of the responses. Only quotes representing

common, rather than idiosyncratic responses were used. Lastly, a chapter summary was presented marking the end of the chapter.

5.2 Findings

- ✓ The study established that teachers mostly use the demonstration and group work method when teaching addition of fractions.
- ✓ The study also established that teachers face challenges of managing classes with many learners and lack of teaching resources.
- ✓ The study also established that teachers help grade 5 learners to understand addition of fractions by remediating slow learners during the lesson, using concrete teaching and learning media when teaching and engaging parents in their learning to ensure homework compliance. .
- ✓ The study also established that staff developing teachers on how to teach addition of fractions can enhance their expertise on how to help grade 5 learners to understand addition of fractions.

5.3 Conclusion

Based on the research findings, the following conclusions were made:

- ✓ Using demonstration and group work method in teaching addition of fractions can help grade 5 learners understand addition of fractions.
- ✓ The main challenges which teachers face are managing classes with many learners and lack of teaching and learning resources.
- ✓ Teachers can help grade 5 learners to understand addition of fractions by remediating slow learners during the lesson, using concrete teaching and learning media when teaching and engaging parents in their learning to ensure homework compliance.
- ✓ Staff developing teachers on how to teach addition of fractions can enhance their expertise on how to help grade 5 learners to understand addition of fractions.

5.4 Recommendations

From the conclusions drawn above, the following recommendations were made:

- ✓ There is need for teachers to use demonstration and group work method when teaching addition of fractions at grade 5 level.
- ✓ There is need to reduce teacher to learner ratio in order to eradicate the strain faced by teachers of managing classes with many learners and schools need to be supplied with teaching and learning resources.
- ✓ There is need for teachers to remediate slow learners during the lesson, use concrete teaching and learning media when teaching and engage parents in their learning to ensure homework compliance.
- ✓ There is need for teachers to be staff developed on how to teach addition of fractions in order to enhance their expertise on how to help grade 5 learners understand addition of fractions.

5.5 Areas for further research

Further research can be conducted on:

- ✓ Investigating challenges faced by teachers in teaching addition of fractions at grade 5 level.
- ✓ Exploring ways of helping grade 5 learners understand addition of fractions at grade 5 level.

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APPENDICES

APPENDIX A: Interview Guide for class teachers

Interview Guide: Class Teachers

1. What do you understand by the term fraction?
2. In your opinion, what do you think is the importance of teaching addition of fractions at Grade 5 level?
3. Which methods do you use when teaching addition of fractions at Grade 5 level?
4. What are challenges faced by Grade 5 learners in learning addition of fractions?
5. How can you counteract challenges faced by Grade 5 learners in learning addition of fractions?
6. Is there anything important relating to teaching addition of fractions at Grade 5 level which we have not covered?

APPENDIX B: Questionnaire for Head of Grades

Questionnaire: Head of Grades

1. (a) Which method do you usually use when teaching addition of fractions at grade five level?

(i). Demonstration		(ii). Class collaboration	(iii). Group discussion	
(iv). Lecture method		(v). Peer teaching	(vi)Other method	

(b) Which teaching method do you think is the most effective in teaching addition of fractions at grade 5 level?

.....

(c) What resources do you use when teaching addition of fractions at grade five level?

.....

(d) How often do you use the method mentioned in (a) above?

Regularly	
Occasionally	

2.(a). Which teaching method are you familiar with?

.....

(b) What difficulties are you facing when choosing a teaching method?

.....

(c) Do you have/use adequate teaching resources?

Yes	
No	

(d) If yes/no give an explanation.

.....

3. (i). Do you have slow learners?

Yes	
No	

(ii). How do help the slow learners to catch up with others?

.....

(iii). How do you group your learners, mixed ability grouping or ability grouping?

Mixed ability grouping	
Ability grouping	

(iv). Do you offer remediation during lesson or after remediation?

During the lesson	
After the lesson	

APPENDIX C: Letter of permission to carry out research in the Ministry of Primary and Secondary Education (MoPSE) institutions

all communications should be addressed to
"The Provincial Education Director"
Telephone: 09 49311
Telegraph: "MOPSEEN ZW"
Telex: 30531 MOPSEEN ZW
Fax: 09 77027



Ministry of Primary and Secondary Education
Bulawayo Metropolitan Province
P O Box 555
Bulawayo
Zimbabwe

25 November 2024

Matare Ernest

BINDURA UNIVERSITY OF SCIENCE EDUCATION

**RE: PERMISSION TO CONDUCT A RESEARCH ON: EXPLORING TEACHING
METHODS USED BY GRADE 5 TEACHERS IN TEACHING ADDITION OF
FRACTIONS. THE CASE OF KHAMBI DISTRICT: BULAWAYO
METROPOLITAN PROVINCE**

Reference is made to your application for permission to carry out research in the Education Institutions under the jurisdiction of the Bulawayo Metropolitan Province. Permission is hereby granted.

It will be appreciated if you could furnish our provincial office with the final copy of your research which may contain information useful to the development of education in the province.

A handwritten signature in black ink, appearing to read 'Sibanda'.

**Sibanda G.T.
For: PROVINCIAL EDUCATION DIRECTOR
BULAWAYO METROPOLITAN PROVINCE**

