

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

BACHELOR OF SCIENCE EDUCATION HONORS DEGREE IN MATHEMATICS



AN EXPLORATION OF THE ADDITION OF GRADE THREE FRACTIONS. A CASE OF
CHINHOYI DISTRICT

BY

HLATYAAYO LANGTON

B225774B

A DISSERTATION SUBMITTED IN PARTIAL FULLFILMENT OF THE REQUIREMENTS
OF THE REQUIREMENTS OF THE BACHELOR OF SCIENCE HONORS DEGREE IN

MATHEMATICS EDUCATION

DECEMBER 2024

RELEASE FORM

Title of the dissertation: An exploration of the addition of grade three fractions using a situative perspective. A case of Chinhoyi District.

To be completed by the student:

I certify that this dissertation is in conformity with the preparation guidelines as presented in the Faculty Guide and Instructions for Typing dissertations.

.....

(Signature of the student)

(Date)

To be completed by the supervisor:

This dissertation is suitable for submission to the faculty. This dissertation was checked for conformity with the Faculty guidelines.

(Signature of supervisor)

(Date)

To be completed by the Chairman of the Department:

I certify, to the best of my knowledge that the required procedures have been followed and the preparation criteria has been met for this dissertation.

✓

.....\.....\.....

(Signature of the chairman)

(Date)

APPROVAL FORM

Name of the student: HLATYAAYO LANGTON

Registration Number: B225774B

Dissertation Title: An exploration of the addition of grade three fractions using a situative perspective. A case of Chinhoyi District

Degree Title: Bachelor of Science Education Honors Degree in Mathematics.

Year of completion: 2024

Permission is thereby granted to Bindura University of Science Education to single copies of this dissertation and to lend or sell such copies for private, school and scientific purposes only. The author reserves any publication rights and neither dissertation nor extensive extracts from it be granted or otherwise be reproduced without the authors consent.

Signed.....

Permanent Address: Chirorodziva Primary School

PO Box 442

Chinhoyi

ACKNOWLEDGEMENTS

I acknowledge and I am thankful for the mentorship, guidance and encouragement from my supervisor, Dr Chagwiza without him this study would have been a flop.

I am also indebted to the unconditional love and support of my wife Mr. Hlatyaayo , who has always stood by me even through this academic forage.

I am also grateful for the love and encouragement of my children and siblings.

Above all else, after all has been said and done, all Glory and Praise be to Jehovah God! The one who in the fullness of time has made everything beautiful.

DEDICATION

This research is dedicated to Leadson Hlatywayo, the man who brought me into this world.

ABBREVIATIONS AND ACRONYMS

Dr	Doctor
Tr	Teacher
SH	School Head

ABSTRACT

Using a situative approach, this study investigated the addition of grade three fractions in Chinhoyi District. The situative educational philosophy served as the theoretical foundation for the investigation. Nine teachers and three school heads made up the sample of twelve participants in this qualitative study. Data were gathered through observation, document analysis, and interviews. Teachers' knowledge of situative methods for teaching grade-level fraction addition was mediocre. This is due to the fact that it was shown that the majority of teachers only knew about three different types of situative approaches when it came to teaching third-grade students how to add fractions. These included using problem-based learning, scaffolding, and collaborative learning. Techniques to reduce the difficulties teachers encounter when instructing third-grade addition were identified

Strategies to minimize challenges faced by teachers when teaching addition of grade three fractions using situative approaches were individualized learning, providing ongoing professional development for teachers and careful planning with improvisation. The effectiveness use of situative approaches in teaching grade three fractions were noted as enhanced problem solving by learners, active engagement and collaboration, enhanced conceptual understanding and elevated memory retention. Among the recommendations of the study are that the Ministry must provide regular in-service teacher training so that teachers remain in touch with modern situative approaches in teaching addition of fractions at grade 3 level. School administrators in conjunction with School Development Committees (SDCs) must strive towards the provision of all modern and traditional resources to facilitate the effective utilization of situative approaches in teaching addition of fractions at grade three level.

TABLE OF CONTENTS

RELEASE FORM.....	ii
APPROVAL FORM	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
ABBREVIATIONS AND ACRONYMS	vi
ABSTRACT	vii
TABLE OF CONTENTS.....	viii
LIST OF TABLES	xi
Table 4.1 Biographical data	xi
CHAPTER ONE	1
INTRODUCTION	1
Introduction.....	1
1.2 Background of the Study	1
Statement of the problem	3
1.4 Significance of study.....	3
1.5 Research questions.....	8
1.6 Delimitation	8
1.7 Limitations	9
1.8 Definition of terms	10
1.8.1 Situative perspective	10

1.8.2 Addition of fractions	11
1.9 Chapter Summary	11
CHAPTER TWO	12
LITERATURE REVIEW	12
2.0 Introduction.....	12
2:2Conceptual Framework.....	14
2:3Related Literature	14
2:3:1 Teaching of the Addition of Fractions using Situative Perspective	15
2.3.2 Challenges and Opportunities of Situative Perspective methods in teaching Addition of Fractions.....	17
2.3.3:Benefits of Teaching and Learning Addition of Fractions at Grade 3 Levelusing.....	20
Situative Approaches	20
2:4Summary.....	23
CHAPTER 3	24
RESEARCH METHODOLOGY.....	24
3.0 Introduction.....	24
3.1Research Methodology	24
3.2Research design	25
3.4Research paradigm.....	26
3.4 Research instruments	26
3.3. 1Interviews.....	27
3.3.2Observation.....	27
3.3.3Document analysis	28
3.4 Population	29
3.5 Sample and sampling techniques.....	29
3.6 Data analysis method	30
3.7 Validity and reliability	31
3.7.1Trustworthiness.....	31
3.7.2 Dependability.....	31
3.7.3 Credibility	31
3.7.4 Transferability.....	31

3.7.5 Confirmability.....	32
3.8 Ethical considerations	32
3.8.1Permission.....	32
3.8.2 Confidentiality	33
3.8.3 Anonymity	33
3.8.4Informed consent	33
3.9 Chapter Summary	33
CHAPTER FOUR.....	35
DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS	35
4.1 Introduction.....	35
4.2 Biographical data	35
4.3 Teachers’ awareness of situative approaches in teaching addition of grade 3 fractions	40
4.4 How are the challenges encountered in the implementation of situative perspective be minimized?.....	48
4.5 Why are situative approaches effective in the teaching and learning addition of grade 3 fractions.....	54
4.6 Summary	60
CHAPTER FIVE	61
SUMMARY CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY	61
5.1 Introduction.....	61
5.2 Summary of the study	61
5.2.1 Summary of research findings	62
5.3 Conclusions.....	64
5.3.1 Teachers’ awareness of situative approaches in teaching addition of grade 3 fractions.....	64
5.3.2 How are the challenges being faced in the utilisation of situative approaches be minimized	64
5.3.3 Why are situative approaches effective in teaching addition of grade fractions	64
5.4 Recommendations.....	65
References.....	67
APPENDICES.....	72
Appendix A Permission to conduct the research	72
Appendix B Reasearch Instruments.....	74

Interview guide for a teacher	74
Interview guide for a school head.....	75
Observation guide.....	76
Document analysis guide.....	76
Appendix C Plagiarism Similarity	
Index.....	77

LIST OF TABLES

Table 4.1 Biographical data	31
Table 4.2: Teachers' awareness of situative approaches.....	34
Table 4.3 How can the challenges encountered in the implementation of situative approaches be minimized.....	40
Table 4.5 Why are situative approaches effective in teaching addition of grade three fractions.....	44

CHAPTER ONE

INTRODUCTION

Introduction

This study explored the addition of Grade 3 fractions using a situative perspective in Chinhoyi District. This chapter provides a background of the study detailing the history of the problem under investigation. The chapter also provides a statement of the problem. The research questions that the study sought to ultimately answer are listed. Subsequently, the significance of the study is outlined. The chapter then presents the delimitation, limitations and finally definition of terms are provided.

1.2 Background of the Study

Learners utilize the knowledge of adding fractions in their daily experiences but still find it a challenging concept to grasp. This is so because of how addition of fractions is being taught at grade 3 level. Globally addition of fractions is being taught using procedural methods of rules and computations where learners do not truly understand the logic behind operations instead, they memorize the rules and formulas (Boud and Felletti, 2019). Hlabati (2020) highlighted those teachers in Mozambique frequently use textbook procedures and worksheet assignments. Teaching and learning of fraction addition is to a lesser extent being taught using manipulatives such as concrete object and visual aids. Malzah (2022) found out from a national survey that Primary School classes use concrete materials. Manipulatives are being used in teaching fractions do not align with the learners' experience and social interactions thus this hinders conceptualizing. Group learning is also evident in fraction lessons at Chirorodziva Primary School. Teachers simply arrange learners in groups and send them off to work without creating conditions for group work. Sizoka (2020) advocated that teacher must group learners in ways

that accommodate learning, ask questions that scaffold thinking and provide support. Teachers at the school also question and answer technique. Hlabati (2020) pointed out that good questioning help learners connect their prior knowledge and explore its application in real contexts. Unfortunately, many teachers struggle to ask questions because they lack taxonomies

Situative approaches can be highly effective in teaching and learning the addition of fractions in Grade 3. According to Lave (2019) Situative approaches emphasize contextual and interactive learning experiences, where students actively engage with real-life situations and collaborate with their peers. Situative approaches are beneficial as they provide meaningful learning that allow students to connect their learning to real-world situations such as adding ingredients in a recipe. Situative approaches often involve collaborative learning. Situative approaches often incorporate multiple representations of mathematical ideas. Learners can use manipulative, visual models, diagrams, and symbolic notation to represent fractions and their addition. Cortina et al (2019) supports that this variety of representations helps students develop a deeper understanding of the concept and supports their ability to visualize and conceptualize fractions. Situative approaches provide opportunities for ongoing formative assessment. Teachers can observe students' thinking processes, monitor their progress, and provide timely feedback. Through class discussions, questioning techniques, and analyzing students' strategies, teachers can identify misconceptions, scaffold learning, and address individual needs effectively.

This study used the situative perspective to investigate situative approaches grade 3 teacher can employ in teaching addition of fractions.

Statement of the problem

The teaching of addition of fractions poses significant challenges for both students and educators. Copur-Gencturk and Olmez ((2020) highlighted that teacher themselves lack the knowledge and expertise on the concept of fraction operation. Traditional instructional approaches often emphasize procedural fluency, focusing on algorithms and step-by-step processes for adding fractions. This has resulted into a variety of challenges relating to conceptualization of fractions at Grade 3 level.

This study explored the teaching and learning of adding of fractions in a situative perspective. By exploring alternative instructional approaches, such as situative perspectives, students' conceptual understanding, problem-solving skills, and overall mathematical proficiency in the domain of fraction addition can be enhanced (Dewali, 2023).

1.4 Significance of study

Addition of fractions is of real-world significance as learners use the concept of sharing in their social daily activities. Being able to grasp the addition of fractions is the pre-requisite to understanding the other three operations namely subtraction, multiplication and division (Okparo, 2021). The study can benefit various stakeholders within the education system which include the Education Ministry, administrators, learners, teachers and parents

Ministry of Primary and Secondary Education

The study on the situative approach in the teaching and learning addition of fractions offers valuable insights to the Ministry of Primary and Secondary Education (MOPSE). It informs curriculum development, enhance teaching practice, promote equity and inclusion and afford the chance to align learning outcomes with the development of 21st century skills. By embracing the

situative perspective, the Ministry of Education foster effective and meaningful learning experiences for students in the domain of addition of fractions. This leads to improved Mathematical proficiency and increased engagement in activities that require application of the concept in real contexts.

Administrators

The study shall provide administrators with evidence of the effectiveness of the situative approach in teaching addition of fractions. This evidence can guide administrators in making informed decisions about instructional practices and curriculum implementation. Administrators can use the findings to support the adoption of the situative approach in their schools or districts, ensuring that teaching methods align with research-supported strategies. According Schunk (2020) the situative approaches create a supportive learning environment. The situative approach emphasizes collaborative learning, active engagement, and problem-solving. Administrators can support teachers in creating classroom environments that facilitate these practices. This may involve providing resources, materials, and technology that promote hands-on activities, fostering a culture of collaboration among teachers, and facilitating professional development opportunities that focus on the situative approach. It is also significant in enhancing Teacher Professional Development. Administrators can use the study to inform and shape professional development initiatives for teachers. By highlighting the effectiveness of the situative approach, administrators can prioritize training and workshops that help teachers understand and implement this approach in their classrooms. Okparo (2021) encouraged that providing ongoing support and resources to teachers allows them to improve their instructional practices and enhance student learning outcomes.

Monitoring and assessment is made easy and authentic on the side of administrators which clearly shows the significance of this study. The study's findings can influence administrators' approaches to monitoring and assessing student progress in the domain of addition of fractions. Robertson et al (2021) say that administrators can encourage the use of formative assessment strategies that align with the situative approach, such as observations, discussions, and authentic performance tasks. This allows administrators to gauge the effectiveness of the situative approach in classrooms and make data-informed decisions to support teachers and students. It can foster collaboration and professional learning communities: The situative approach emphasizes collaboration among students and teachers. Administrators can foster a culture of collaboration by creating opportunities for teachers to engage in professional learning communities (PLCs) focused on the situative approach. Dewali (2023) noted that these collaborative spaces allow teachers to share experiences, exchange ideas, and collectively problem-solve to improve instruction in the teaching of addition of fractions. Parent and community engagement. Administrators can communicate the significance of the study's findings to parents and the wider community. By sharing information about the benefits of the situative approach, administrators can help parents understand the instructional methods being used and the rationale behind them. This can foster support and understanding among parents, enabling them to actively engage in their child's mathematics education

Parents

Improved understanding of teaching methods. The study shall provide parents with insights into the instructional methods used in their child's mathematics education, specifically in the context of addition of fractions. By understanding the situative approach, parents can gain a clearer picture of how their child is learning and how concepts are being taught. This understanding

enables parents to better support their child's learning at home and engage in more meaningful conversations about mathematics.

Appreciation for real-world relevance is of significance to parents as stakeholders. The situative approach emphasizes connecting mathematics to real-world contexts (Iszak et al, 2019). By understanding the significance of this approach, parents can appreciate how addition of fractions relates to practical scenarios in everyday life. This awareness can help parents reinforce the relevance of fractions and support their child in making connections between classroom learning and real-world applications.

The situative approach focuses on developing a deep conceptual understanding of addition of fractions. Parents can reinforce this approach by encouraging their child to think critically, reason, and explain their thinking when working on fraction problems. By valuing conceptual understanding over rote memorization, parents can support their child in building a strong foundation in fraction operations specifically addition. Lave (2019) pointed out that real-life problems can inspire parents to engage in math-related activities with their child that align with the situative approach. This can involve cooking together and discussing fraction concepts while measuring ingredients, solving real-world fraction problems during shopping trips, or exploring fractions in everyday objects or situations. By incorporating these activities, parents can make math more enjoyable and help their child develop a positive attitude towards fractions and mathematics as a whole.

Parents develop effective communication with teachers. Understanding the situative approach allows parents to effectively communicate with their child's teachers. Parents can inquire about how the approach is being implemented in the classroom, ask for suggestions on how they can

support their child's learning at home, and seek feedback on their child's progress. This collaborative partnership between parents and teachers strengthens the support system for the child's mathematical development.

Teachers and Learners

The study shall provide teachers with evidence-based pedagogical strategies for teaching addition of fractions. By understanding and implementing the situative approach, teachers can enhance their instructional practices and promote more meaningful and engaging learning experiences for students. The study offers insights into collaborative learning, problem-solving, and authentic contexts, guiding teachers in incorporating these strategies into their lessons (Sizoka, 2020)

The situative approach focuses on developing a deep conceptual understanding of addition of fractions. Teachers can utilize this approach to help students move beyond procedural knowledge and memorization, fostering a solid foundation in fraction concepts. By emphasizing conceptual understanding, teachers can support students in making connections, reasoning mathematically, and applying fraction knowledge to real-world situations.

The situative approach recognizes the diverse needs and learning styles of students thus leads to differentiated instruction. Teachers can adapt their instruction to meet the individual needs of their students, providing appropriate support and challenges. . Peterson et al (2019) confirms that this approach encourages teachers to differentiate instruction, offering various entry points, resources, and scaffolding techniques to address the range of students' learning abilities and promote their success in addition of fractions. The situative approach promotes active student engagement and motivation through collaborative learning and authentic problem-solving. By

implementing this approach, teachers can create a positive and interactive classroom environment where students actively participate in discussions, explore multiple strategies, and apply their knowledge to real-world contexts. This can enhance students' interest and motivation in learning addition of fractions.

Kuponda (2019) posits that the situative approach aligns with the use of formative assessment strategies. Teachers can employ various formative assessment techniques, such as observations, discussions, and performance tasks, to monitor student progress and understanding. This allows teachers to gather timely feedback and make instructional adjustments, ensuring that students are effectively learning addition of fractions. The study on the situative approach offers teachers an opportunity for professional growth and collaboration.

1.5 Research questions

- i. What situative approaches are Grade three teachers aware of in the teaching of addition of fractions?
- ii. How are the challenges encountered in the implementation of situative perspective methods be minimized?
- iii. Why are situative approaches effective in the teaching and learning addition of fractions at Grade three level

1.6 Delimitation

The study confined to nine classes in Hurungwe East District in the Mashonaland West Province in Zimbabwe. The study was guided by the situative approaches that can be used to teach addition of fractions to Grade three class. Theoretically the study was confined to the situative

epistemology and fraction conceptualization model as theoretical framework. The study was guided by qualitative methodology. The sample used was of twelve participants

1.7 Limitations

Time constraints was a major limitation. Implementing the situative approach often requires adequate time for collaborative activities, problem-solving, and in-depth discussions. However, time constraints within the classroom posed a challenge for teachers. The study did not fully address the practicalities of implementing the situative approach within limited instructional time, which could have impacted its feasibility in real-world classroom settings. The researcher maximized the available time for conducting the study.

Teachers' poor preparedness and support was a limitation to the implementation of a situative approach. The successful implementation of the situative approach relies on teachers' understanding, knowledge, and pedagogical skills. However, the study may not have explored the specific professional development needs or support mechanisms required for teachers to effectively adopt this approach. Lack of adequate teacher preparation and ongoing support hindered the implementation of the situative approach in teaching addition of fractions. The teachers need to engage in professional development programs and incorporate e-groups where collaboration with peers is fostered as a measure to alleviate the limitation.

The study has not thoroughly examined the assessment methods used to evaluate students' learning outcomes within the situative approach. Traditional assessment methods, such as standardized tests or written exams, have not fully captured the complexity of students' conceptual understanding and problem-solving abilities fostered by the situative approach.

Further exploration of appropriate assessment strategies aligned with this approach was beneficial.

Limited focus on individual differences. The situative approach emphasizes collaborative learning and social interaction. However, individual differences in learning styles, abilities, and preferences may not have been extensively addressed in the study. It is important for teachers to consider how to effectively scaffold and support individual students within the collaborative learning environment to ensure equitable opportunities for all learners. Tolerance and acceptance of diversity in the study was employed to cab the limitation

1.8 Definition of terms

1.8.1 Situative perspective

The situative perspective, also known as the situative approach or situativity theory, as defined by Crawford (2020) is a theoretical framework in education and cognitive science that emphasizes the role of social and contextual factors in learning and knowledge construction. It proposes that learning is not just an individual cognitive process but is deeply influenced by the social and cultural context in which it occurs. According to the situative perspective, knowledge is situated or embedded within specific social and cultural contexts, and learning is seen as a process of active participation and engagement in authentic activities. Abbas (2020) also suggests that learning occurs through meaningful interactions with others, the environment, and cultural artifacts. These interactions help learners develop skills, knowledge, and understanding by actively constructing meaning and solving real-world problems.

1.8.2 Addition of fractions

Addition of fractions is a mathematical operation that combines two or more fractions to create a single fraction that represents their sum. It involves adding the numerators (the top numbers) of the fractions while keeping the denominators (the bottom numbers) the same. The result is a fraction that represents the total or combined value of the fractions being added.

1.8.3 Teaching and learning

Teaching refers to the deliberate and systematic activities carried out by an educator or instructor to facilitate learning in others. It involves the planning, organization, and delivery of educational content and experiences with the goal of promoting the development of learners. Learning is the active and transformative process through which individuals acquire knowledge, skills, attitudes, and competencies. It involves making meaning and constructing understanding based on new information and experiences.

1.9 Chapter Summary

This chapter provided a background to the study in which the origins of the study problem were chronicled. The chapter also provided a statement of the problem. The objectives that the study sought to fulfil and the questions that the research aimed to ultimately answer were listed. Subsequently, the significance of the study was outlined. The chapter then presented the delimitation, limitations and finally, definition of terms were provided. The next chapter reviews literature related to the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature related to the study. The chapter will first discuss the situative perspective and fraction conceptualization model. It serves as the study's theoretical foundation. The study will then examine previous researches on the subject areas covered by the research questions, that is: What situative approaches are Grade three teachers aware of in the teaching of addition of fractions?, How are the challenges encountered in the implementation of situative perspective methods be minimized and Why are situative approaches effective in the teaching and learning addition of fractions at Grade three level

2:1Theoretical framework

Crawford (2020) describes a theoretical framework as an overview of the most important ideas currently in existence that provides a platform for argument development and aids in the planning and execution of research projects. The theoretical framework of a situative approach is grounded in the field of educational psychology and emphasizes the importance of social and contextual factors in learning and knowledge construction.

2.1.1 Situative Learning Theory

Situative approaches reject the notion that learning is solely an individual cognitive process and instead emphasize the situated nature of learning, meaning that learning occurs within specific social and cultural contexts (Salawu et al, 2023). The key proponents of situative perspective are

Jaen Lave and Eitene Wenge (community of practice), Allan Collins (theory of cognitive apprenticeship), James G Greeno (situativity learning), Jullius Nyerere (education for life) and Vygotsky (zone of proximal development). The notion that learning is a social and contextual process is the foundation of the situative method to teaching and learning addition of fractions. It highlights how crucial it is for children to actively engage in purposeful mathematical tasks in a group environment. The key ideas behind this strategy according to Schunk (2020) are social context, authentic task and assessment, multiple representations, metacognition and reflection, scaffolding and culture diversity

2.1.2 Fraction Conceptualisation Model

Lehman et al (2019) explained the Fraction Conceptualization Model (FCM) as a mathematical education framework that emphasizes the importance of multiple representations, including visual models and manipulatives, in students' understanding of fractions.

The Fraction Conceptualization Model is an instructional approach that helps students understand fractions and their relationships. Lehman et al (2019) outlined that FCM consists of three stages which are partitioning, iterating, and applying operations. In the partitioning stage, students learn to divide a whole into equal parts and recognize fractions. In the iterating stage, they learn to iterate or repeat fractional parts to create larger quantities. In the applying operations stage, students apply their understanding to perform operations. In order to help students better comprehend fractions, the teacher must adopt the Fraction Conceptualization Model and focus on giving learners tangible manipulative, visual aids, and real-world settings. In addition to promoting a deep understanding teachers need to foster active involvement, conversation, and reflection.

2:2 Conceptual Framework

Crawford (2020) defines conceptual framework as a lens through which researchers can understand, analyze, and integrate the existing knowledge within a specific field. It serves as a guide for organizing the literature, identifying research gaps, formulating research questions, and informing the research design and analysis. The main concepts of the research are authentic context, social interaction and collaboration activities. The method encourages the use of real-world tasks that mimic scenarios in which fractions are encountered (Izsak et al, 2019). These assignments give students relevant scenarios in which to practice and investigate addition of fractions. Partitioning a cake into equal positions say $\frac{1}{10}$ and allowing learners to add up their pieces to form a total fraction is an example of an authentic activity.

Abbas et al (2020) points out that the situative method acknowledges that social interaction plays a role in the learning process. It promotes communication and cooperative learning between students and the instructor. Pupils build their grasp of addition of fractions through conversations, problem-solving, and sharing of strategies. The emphasis of the situative method to teaching and learning is on group projects that promote social engagement, information sharing, and a deeper comprehension of the material (Izsak et al, 2019). These include cooperative learning exercises, peer tutoring, and group problem-solving. Tasks involving cooperative learning are organized group activities with designated roles for every participant. For example, learners can build the whole by each learner in the group putting a fraction cake to build the whole. These main concepts contribute to the good adding of fractions

2:3 Related Literature

Literature on relevant and related studies was reviewed as follows.

2:3:1 Teaching of the Addition of Fractions using Situative Perspective

Renga et al (2020) investigated teachers' utilisation of situative approaches in teaching fractions to learners in Texas K12 schools in the United States of America (USA). The study conducted 30 interviews and carried out observation. According to Renga et al (2020), teachers mostly utilised problem-based learning as the situative perspective approach. The study determined that in problem-based learning of mathematics, the problem is initially faced without any prior planning or research. Subsequently, students interact in groups to explore their prior knowledge in relation to the problem. Renga et al (2019) found that the final step is that learners approach the topic in a way that allows their reasoning and knowledge application skills to be tested and assessed according to their learning level. The authors finally concluded that learners determine what more they needed to learn in order to solve the problem.

Similarly, Ifunanya (2021) found that primary schools in Winsconsin, USA, teachers utilize various situative approaches to nurture critical thinking in mathematics among learners. For instance, Ifunanya (2019) found that teachers incorporate storytelling to make connections to real-world scenarios because it allows learners to see how certain fraction concepts can apply to real life. According to Hlabati (2020), another effective strategy for teaching students about the application of mathematics in real-world scenarios is through the use of story problems.

Similar to Fendi (2020)'s findings, Copur-Gencturk (2021) also found that teachers in Hobart, India also utilised problem-based learning in which learners would use word problems to illustrate addition of fractions . Copur-Gencturk distributed 50 questionnaires and determined that 90% of the teachers utilised problem-based learning, 85% utilised diagrammatic

illustrations, 70% utilised scaffolding and 68% utilised reflective question and answer discussions with learners. Copur-Gencturk (2021) concluded that the utilization of word problems in learners' related problems was the most popular situative technique utilised by teachers. . Therefore, Fendi (2020) also concluded that scaffolding is an essential component of rationalist teaching approaches in mathematics because learners would be required to utilize innate mathematical facts from social experience to solve problems or execute tasks in future topics or lessons. Situative approaches emphasize the role of social interaction in learning. Learning is seen as a collaborative process where learners actively engage with others, such as peers, teachers, and experts, to construct knowledge and meaning.

In Onitsha, Nigeria, Burnad et al (2020) investigated the effects of teaching through a situative perspective. They discovered that reflective question and answer or discussion with learners is another situative technique that teachers utilised in teaching and learning of fractions. Burnad et al (2020) administered 15 in-depth interviews and carried out observation and document analysis. According to Burnard et al (2020), teachers would ask learners why they were making certain suppositions or solving the problem in a particular way to nurture reasoning and logicism in the learning of mathematics among learners. The study concluded that in some cases learners acquire mathematical understanding through a deliberative or discursive approach in which they have to justify their approach and demonstrate their reasoning or logical thinking. According to Burnad et al (2020) highlighted that reflection occurs in many forms including own actions and conversation with peers. This communication can promote and guide reflection. This reaffirms the Vygostian (1986) view of reflection that is intertwined with semiotic mediation. When teaching addition of fraction to Grade three learners it is therefore essential to provide

opportunities for reflection and metacognition so learner can evaluate their own learning and that of others.

In Nyanda, Zambia, Kuponda (2019) investigated found that one situative technique that was utilized by teachers was to apply mathematical knowledge to everyday life. Kuponda (2019)'s study was qualitative and conducted 13 interviews and carried out observation at one primary school. According to Kuponda (2019), the teachers indicated that applying Mathematical knowledge to everyday life enabled the learners to better understand fraction symbols and processes. For instance, when teachers gave examples that involved addition of $\frac{1}{4}$ cup of flour and $\frac{3}{4}$ cup of mealie-meal to prepare dour for traditional bread at home. The study concluded that situativity in mathematics can be stimulated by appealing to the imagination of the learner and to make this more vivid, relating the concepts to everyday life experiences is essential. For instance, the concept of adding fractions of chemicals and inputs they use in gardening. According to Lave (2019), situative approaches make mathematical concepts more relatable to young learners.

2.3.2 Challenges and Opportunities of Situative Perspective methods in teaching Addition of Fractions

Iszak (2019) investigated that challenges that are faced in applying situative methods in the teaching of mathematics at schools in Ankara, Turkey. The study was qualitative and administered 30 interviews to teachers and 5 interviews to school heads. Iszak (2019) found that most of the teachers lacked sufficient fractional knowledge. Iszak (2019) suggests that while most mathematical lessons are goal oriented and guided by specific objectives, the activities that are utilised by teachers are not always the best to effectively achieve set goals and objectives. Therefore, the study recommended that teachers needed to be trained further to better understand

and distinguish among the several approaches that can be utilised to teach fractions to primary school children.

Similarly, in Indonesia, Gobert and VanDooren (2019) found that teachers tended to rely heavily on empiricist approaches that did not do enough to nurture conceptual or facilitate cognitive development among learners. The study was of a mixed method and distributed 40 questionnaires, administered 15 in-depth interviews, carried out observations and document analysis. Gobert and VanDooren (2019) also found that a failure to tactfully utilize a hybrid of instructional approaches was a challenge to the effectiveness of utilizing approaches within the situative perspective. According to the study, learners cannot learn from abstract concepts alone nor can they learn from practical work alone but there has to be a healthy balance between empiricism and situativity in the classroom. However, teachers often failed to effectively combine a variety of approaches in the teaching of fractions that are authentic. The study therefore recommended that the teaching and learning of addition of fractions must therefore include story problems that relate to the natural settings of learner experiences. Gobert and VanDooren (2019) also advocated on application of a hybrid approach that could lead to the complementing of each approach's advantages and therefore enhancing the learner's chances of acquiring the concept of adding fractions. Therefore, group work, projects, storytelling and use of concrete objects that relate to real life were proposed

Abbas et al (2020) investigated the hindrances to the effectiveness of situative approaches in the teaching of fractions at selected primary schools. The study distributed 90 questionnaires and conducted 10 in-depth interviews as well as observation. The study established that the most prominent situative approaches were heavily reliant on the natural cognitive abilities of learners. According to Abbas et al (2020), when the learner had a learning disability or impaired

intellectual ability, situative approaches were of little effectiveness. Furthermore, the study found out that the inadequacy of teaching aids and the school environment also acted as hindrances. The study established that the school environment must be stimulating, endowed with audio-visual media, props, mathematical tools that would consistently stimulate the child's mind. Inclusive teaching and learning activities in addition of fractions must therefore be situated to cater for every learner

Leong et al (2019) investigated the extent to which teachers effectively applied situative approaches in the teaching of mathematics to primary school learners and the challenges faced. The study was qualitative and utilised in-depth interviews and observation to collect data from a sample of 25 participants. Leong et al (2019) suggests that challenges in situative approaches can be minimized by use of technological resources, for instance, the visual projection of shapes and fractions. Therefore, the study concluded that a deficiency of technological resources is often one of the looming challenges experienced in various schools. According to the study, while teachers could draw shapes on the board, audio-visual media could more efficiently and accurately project shape and other projections efficiently and as many times as necessary for learners to understand mathematical concepts with addition of fractions included. It is therefore imperative to infuse technology that relate to the learners social and cultural context for stimulation and prompts the conceptual understanding in adding fractions.

Rothman and Summons (2019) found that teachers' reliance on simply feeding learners mathematical facts and not providing opportunities for the learners to apply those facts to solve problems using own logic and reasoning made addition of fractions a cramming exercise that does not nurture conceptual understanding. As a result, the concept appears difficult for the learners because when confronted by a problem that does not fit exactly with taught concepts, the

learners become stuck. Rothman and Summons (2019) recommends that teacher training colleges must enhance the curriculum to enable teachers to better apply situative approaches that relate to learner experience so that they are able to apply when faced with similar problems in their course of study and in real settings. Therefore project-based learning with story problems that relate to the immediate environment of learners is of effectiveness when teaching and learning addition of fractions at Grade 3 level.

2.3.3: Benefits of Teaching and Learning Addition of Fractions at Grade 3 Level using

Situative Approaches

In New Zealand, Dewali (2023) discovered that situative approaches such as problem-based learning have several advantages. Their study utilised 60 questionnaires to finding out from teachers of five selected schools what impact situative teaching approaches have on learners in mathematics. Dewali (2023) found, for instance, that enhanced motivation and improved cross-disciplinary knowledge integration are benefits of problem-based learning. The study concluded that problem seems to act as a trigger to motivate learners to find out for themselves. In support Lave (2019) also concluded that problem-based learning promotes authentic learning, which is characterized by a thorough comprehension of the subject matter, the capacity to apply knowledge to other fields, and the capacity for learners to reflect on their learning experiences. Furthermore, the study concluded that the situative approach is student-centered, meaning that student energy is essential to its success.

A study by Neiser et al (2023) in Bangladesh also found that situative approaches have several positive outcomes among learners. They conducted a qualitative study that interviewed 30

teachers and 3 schools heads from three teachers in one District. According to Neiser et al (2023), the teachers indicated that situative approaches are advantageous in that they are relevant to the learners' goals. This is especially true for project-based learning exercises, because the stimulus statement typically originates from the subject matter that the students are studying. The study also found that, since the problems are drawn from real-world scenarios, situative techniques place the students in the position of apprentice professionals solving actual difficulties. Neiser et al (2023) also concluded that Situative learning methods are pertinent to students' experiences. The source of the knowledge or abilities that students require to solve a problem-based learning task is irrelevant. Their life experience, along with all of their other expertise, is acknowledged and cherished.

Another study in Namibia by Sizoka (2020), replicated similar findings to those of Neiser (2023). For instance, Sizoka (2020) found that in situative approaches learners enhance their knowledge acquisition skills by developing critical thinking. For example, the project-based and group learning processes encourage learners to use their initiative to learn. Furthermore, the study concluded that situative approaches encourage learning for understanding, the emphasis is on clearing up what is not well understood. Sizoka (2020) also found that teachers were of the view that in situative approaches, learners were not just passive encoders of knowledge but would situate the knowledge and be able to justify or explain it. For instance, when group work is involved, students must comprehend the material sufficiently to be able to satisfactorily communicate it to their classmates. The study also found that situativity in mathematics education promotes deep learning, especially when it comes to problem-based learning strategies that are applicable, engaging, and understanding-focused, which increases the likelihood of deep and long-lasting learning.

In a qualitative study in Cape Town, Robertson et al (2021) investigated the benefits of a situative approaches to teaching mathematics at one primary school. The study carried out 15 in-depth interviews and conducted observation. The study established that one of the most prominent benefits was that it enhanced the long-term memory retention of learners and transfer: By highlighting linkages to real-life circumstances, social interactions, and cooperative problem-solving, situative techniques foster a deep knowledge of topics. This level of comprehension improves knowledge retention over time and makes it easier to apply what has been learned to novel contexts. In support Rothman and Summons (2019) pointed out that pupils are more likely to apply what they've learned about fraction addition in a variety of settings and problem-solving contexts, showcasing the adaptability and practicality of their knowledge.

Another study in South Africa by Hargreaves (2019) investigated the impact of situative approaches in teaching fractions with changing times. The study was qualitative and conducted 26 in depth interviews on primary school teachers. Hargreaves (2019) found that when situative approaches are applied they provide authentic or genuine learner evaluation. Situationist methodologies frequently utilize genuine evaluation techniques, surpassing conventional examinations and questionnaires. According to Hargreaves (2019) authentic evaluation measures students' application of their understanding of fraction addition in real-world circumstances, rather than only their procedural knowledge. This can include projects, open-ended questions, or performance-based assignments that call on students to show off their ability to reason, solve issues, and be conscious of their own cognitive processes for example adding proportions

of ingredients in a cooking recipe of a local meal. A more thorough and accurate picture of students' fraction addition competency is provided by authentic assessment.

2:4Summary

This chapter reviewed the research-related literature... The chapter discussed the situative perspective and fraction conceptualization model which serves as the study's theoretical foundation. Subsequently, In order to answer the research questions, the study analyzed the literature in relation to the following subject areas: What situative approaches are Grade 3 instructors aware of while teaching addition of fractions? Why are situative approaches beneficial for teaching and learning addition of fractions at the grade three level, and how may the problems associated with implementing these methods be minimized?. The next chapter is on methodology utilised in this research.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This chapter discusses the research methodology that was utilized to explore the teaching and learning of Grade 3 fractions using a situative perspective at three primary schools in Chinhoyi District. Specifically, the chapter discusses the interpretivist research paradigm, the qualitative approach and the phenomenological research design. Subsequently, the chapter presents the study population, sample size and sampling techniques. The methods of collecting data, that is, in-depth interviews and document analysis was also outlined. The methods of data presentation and analysis as well as methods of ensuring trustworthiness of data were presented. Finally, the chapter discusses the ethical considerations that were made.

3.1 Research Methodology

Alharahsheh (2020) defines research methodology as a roadmap or blueprint for how a study will be conducted. A methodical approach to research is provided by research methodology, which guarantees that the study process is rigorous, well-organized, and in line with the goals of the study. It involves making informed decisions about research design, data collection, data analysis, validity, reliability, ethics, and acknowledging limitations to produce meaningful and credible research outcomes. This research utilized the qualitative methods because it is suitable for investigating sensitive and complex topic such as addition of fractions. Qualitative methods provide a holistic understanding of the research by capturing rich and in-depth detail. It is justified to use these qualitative methods in this study as it allows the researcher to identify

pattern themes and relationships between the data which is what will be needed by researcher to analyze data collected

3.2 Research design

The overall approach you decide on to logically and cogently combine the many study components, guaranteeing you will successfully tackle the research problem, is referred to as the research design Harish (2021). According to Arhta (2020), a research design is the setup of parameters for data collecting and analysis with the goal of balancing economy and procedure with relevance to the research question. In order to obtain a search query and control variance, a research design consists of a concave plan, structure, strategy, and inquiry

The study utilized the phenomenological research design. According to Potter (2019), Phenomenology is a qualitative research method that centers on interpreting phenomena through the participants' firsthand experiences. Based on the experiences and opinions of instructors, this study investigated the phenomena of using and the impact of situative techniques in the teaching and learning addition of fractions to Grade 3 learners. Harish (2021) opines that typically, in phenomenological studies, interviews or focus group discussions are carried out with a group of people who are directly knowledgeable about a situation, event, or experience. The researcher purposively sampled a group of teachers who were knowledgeable about using the situative techniques in teaching fractions. Phenomenology research design was deemed the appropriate design since it has rich and detailed description, small sample size and only essential elements of lived experiences are captured. Bracketing was used by the researcher to document personal experiences. Bracketing (epoche) is when a researcher temporarily set aside their preconceived

notions, biases and assumptions (Creswell, 2022). This allowed the researcher to approach the study with an open and unbiased mind thus, removing oneself from the process.

3.2.1 Research paradigm.

A research paradigm according to Alharahsheh and Pius (2020) refers to the framework or perspective that guides the way researchers approach their investigations and interpret their findings. This demonstrates that the researcher used her own reasoning and cognitive processing, influenced by her contacts with the subjects, to try to make sense of the findings. This implies that this researcher was under the premise that the research subject, that is, the understanding of situative approaches and their utilisation could have multiple realities from participant to participant. According to Irshaidat (2019), the interpretivist paradigm also assumes a naturalistic methodology. The researcher chose this paradigm as it derives data through interpersonal and discursive methods such as interviews, which provided the researcher with access to the participant's native environment.

3.3 Research instruments

Research instruments, also referred to as data collection instruments or tools, are instruments or tools used by researchers to collect data in a systematic and standardized manner. Adosi (2020) says that these tools are intended to collect data or measurements pertinent to the goals or inquiries of the research. The type of data required, the methodology used in the research, and the nature of the study all influence the choice of research instrument. Three ways of gathering data were used in the study which are semi-structured interviews, observation, and document

analysis. This is true because non-numeric data can be collected using these instruments to better understand human behavior and experiences.

3.3.1 Interviews

According to Taherdoost (202) an interview in research refers to a method of data collection where a researcher converses with people or groups in an organized or semi-structured manner in order to obtain data and insights regarding a specific research topic. Individual interviews consist of a researcher and the researched party having one-on-one question and answer sessions.

Nine instructors and three school administrators were the subjects of in-depth interviews at three primary schools in Chinhoyi District. The researcher interviewed teachers on the utilisation and impact of situative approaches in the teaching of mathematics at grade 3 level. The researcher used interviews because they yield in-depth information, flexible, participant interpretation, clarification and probing and gives rich quality data

3.3.2 Observation

As a research method, observation is methodically observing and documenting events, behaviors, or phenomena in a controlled or natural environment (Satapathy, 2023). Through observations, researchers can get firsthand knowledge of behaviors, interactions, and contextual aspects that may be challenging to record using other techniques. The researcher also observed the teaching methods and classroom environment to ascertain the utilization of situative approaches and assess the availability or lack of material resources that could be utilized in the teaching and learning addition of fractions. Sahapathy (2023) outlined advantages of observation in qualitative research. It is a direct method of collecting data, studies of human behavior, the data are highly dependable and accurate, which increases the accuracy of the research findings. Observation was

therefore a more reliable form of primary data sources. The study utilized observation to augment the data that will be derived from other research methods. A disadvantage of observation is that it only allows the researcher to make note of the present and not the past or future plans that may be in place Taherdoost (2020). To alleviate this weakness, the researcher triangulated data collection methods which includes interviews and document analysis as well.

3.3.3 Document analysis

Document analysis was utilized as the other data collection method that complements in-depth interviews. Document analysis as defined as a systematic procedure of examining written or recorded materials which can be used to provide context, generate questions, supplement other types of data, track changeover time and collaborate other sources (Gorsky and Mold, 2020). Researchers analyze these documents to extract relevant information and gain insights into the research topic. According to Adosi (2020), in the research context, official records are used in document analysis.

In this study, document analysis made use of exercise books, record books, lesson plans and learner assessments records as well as school inventory to get an idea of the impact of situative approaches in teaching addition of fraction to Grade 3 learners. Gorsky and Mold (2020) also asserts that document analysis seeks recorded evidence of what the researcher could not personally witness. This study assessed from exercise and record books, the performance of learners in mathematics; and from lesson plans and scheme cum plans, the teaching approaches utilised by teachers in mathematics that the researcher could not personally witness. Hani (2022) posits that, several documents are used in document analysis, which helps to identify condensed themes. Due to its ability to provide rich, non-reactive and complementary data thus this made it a suitable choice for qualitative research

3.4 Population

A target population in research refers to all members who meet the criteria specified for a research investigation (Hosanna et al, 2023). It stands for the broader group to whom the study's conclusions are meant to be applied or extrapolated. A population according to Casteel and Bridier (2021) is the total of all people or elements that may be able to provide relevant data to the study because they are either affected by the research problem or have knowledge and experience of the research problem. In this study, the research population was 51 people comprising of all 49 teachers and the three school heads of three Primary Schools in Hurungwe East

3.5 Sample and sampling techniques

The study utilized a study sample of twelve participants who include nine teachers and three school heads. A sample size of twelve was chosen by the researcher since it was neither too big to overwhelm her with copious amounts of detailed qualitative data nor too little to compromise the population's representativeness.

According Hossana et al (2023), a sample is the segment of the population that the researcher will collect data from. Lincoln and Guba (2021) suggest that qualitative studies are not concerned with large samples but rather with in-depth data but the sample should reasonably be representative of the population.

The study utilized non probability judgmental purposive sampling. The researcher included intermediate teachers at the three schools to be studied in Hurungwe East Circuit. These teachers were purposively sampled because they were the ones likely teaching Grade three learners and

have an overview of the teaching approaches utilized in teaching addition of fractions. The study will also purposively sample the three school heads. Sarfo et al (2022) asserts that non probability judgmental sampling is whereby the researcher utilizes their own judgment to target participants perceived to be able to provide the most relevant data often due to their in-depth knowledge, experience in or proximity to the study subject. This sample approach was used by the researcher since it allowed her to assess which participants could offer the most pertinent data on her own.

This sampling technique is also compatible with an interpretivist paradigm and qualitative approach (Creswell, 2023). The teachers that were purposively sampled likely had lengthy experience in teaching Grade three and this may mean that they had longer time in which they have utilized, or lack thereof, situative approaches in the teaching of addition of fractions even by fellow teachers. The school heads were purposively sampled because as the principal accounting officers responsible for overseeing curriculum implementation they may have an aerial and objective view of the utilization and impact of situative approaches in the teaching of mathematics by teachers at their respective schools.

3.6 Data analysis method

An inductive method of data processing and presentation was used in this study. The study specifically employed thematic content analysis, which is, in accordance with Creswell (2023), the most popular technique for data analysis used in qualitative work that finds, characterizes, elucidates, substantiates, and connects themes. Every piece of information has a meaning, and one can infer this meaning by focusing on a single, key concept that offers the information a thorough understanding. On justification, Potter (2019) pointed out the advantages of using the thematic analysis approach. It is flexible and easy to use and is foundational in nature thus can be

applied as a basis for more rigorous data analysis process. This is why the researcher embraced its utilization on data presentation and analysis.

3.7 Validity and reliability

3.7.1 Trustworthiness

The study ensured trustworthy based on dependability, credibility, transferability and confirmability of data.

3.7.2 Dependability

According to Satapathy (2023), trustworthiness also implies dependability, meaning that, an investigation must also show its audience that its results would be repeated if it were conducted again using the same or comparable respondents (subjects) in the same (or comparable) situation. In this study dependability was ensured by asking a set of consistent questions to participants in the same strata.

3.7.3 Credibility

Adasi (2020) posit that the degree to which data obtained through qualitative methods is impartial or objective and accurately represents the opinions of participants is what is meant by the term "trustworthiness." This study will ensure credibility by utilizing more than one data collection method. The study also ensured credibility by obtaining exhaustive thick description of the participants' perceptions of the research subject.

3.7.4 Transferability

Hossana et al (2023) opines that another principle of trustworthiness is transferability, that is, the degree to which the results can be used with different respondents or in different situations. This

research ensured transferability by describing the study setting as elaborately as possible so that the consumer of this study was able to discern for themselves the similarities and differences of this particular study setting and that of others.

3.7.5 Confirmability

Hosanna et al (2023) argues that another component of data trustworthiness is confirmability. This represents the extent to which the research focus and not the researcher's prejudices produced the findings. A confirmability audit trail was used in this study to guarantee confirmability. This means that a sufficient trail was created to allow the researcher to ascertain whether the results, interpretations, and suggestions can be traced back to their original sources and whether the investigation supports them.

3.8 Ethical considerations

Ethical considerations according Creswell (2023), have all been implemented to maintain the integrity and trustworthiness of the study.

3.8.1Permission

According to Creswell (2023), asking for permission entails getting gatekeepers to provide you official, legal entry to the study environment. According to Casteel and Bridier (2021), conducting a study also requires formal approval from the educational institution. By requesting and receiving permission to conduct the study from the university, the Ministry of Primary and Secondary Education, and the schools to be researched, the researcher adhered to the ethical guideline of permission-seeking.

3.8.2 Confidentiality

Taherdoost (2021) claims that confidentiality is a means of maintaining the privacy of specific participants' participation; that is, there shouldn't be any sign of which individual's data was obtained. By not tying any participant's data to an identifiable reference, the researcher complied with confidentiality ethics. Stated differently, it was made sure that no participant's statements could be linked to them.

3.8.3 Anonymity

According to Alharahsheh (2020), anonymity entails maintaining participant confidentiality, for example names and contact details would not be disclosed in the study. According to Alharahsheh (2020), the researcher must additionally take precautions to guarantee that any identifiable markers in the data are removed. The researcher adhered to the ethical principle of anonymity by refraining from disclosing the subjects' full names or addresses.

3.8.4 Informed consent

According to Potter (2019), informed consent constitutes obtaining voluntary participation from a participant who is fully informed on the nature, scope, length, and goal of the study. By giving each participant an informed permission form outlining every detail of the study, the researcher adhered to the ethical requirement of informed consent. By signing the consent form, the participants acknowledged that their participation was voluntary.

3.9 Chapter Summary

The chapter discussed the research methodology that was utilized to explore the teaching and learning of Grade 3 fractions using a situative perspective at three primary schools in Chinhoyi District. Specifically, the chapter discussed the interpretivist research paradigm, the qualitative approach and the phenomenological research design. Subsequently, the chapter presented the

study population, sample size and sampling techniques. The methods of data collection, that is, in-depth interviews and document analysis were outlined too. The methods of data presentation and analysis as well as methods of ensuring trustworthiness of data were presented. Finally, the chapter discussed the ethical considerations that were made. The next chapter presents, analyses and discusses research findings.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

Research findings are presented, examined, and discussed in this chapter. The biographical information of the participants is initially presented and examined in this chapter. The chapter then goes on to present, analyze, and discuss important research findings related to the research questions' thematic areas, which are: teachers' awareness of situative approaches in teaching addition of fractions at grade 3 level; how are the challenges faced in the utilisation of situative approaches be minimized; and why situative approaches are effective in teaching addition of grade 3 fractions

4.2 Biographical data

Table 4.1 Biographical data

Participant	Gender	Age (years)	Educational qualifications	Work Experience (years)	Area of Specialization
Tr1	Female	34	Diploma in Education	4	Mathematics
Tr2	Male	33	Bed Educational Psychology	7	Shona
Tr3	Female	45	Diploma in Education	11	English
Tr4	Male	51	Diploma in Education	16	Environmental Science
Tr5	Female	44	BED Counselling	13	Shona

Tr6	Female	37	Diploma in Education	12	Mathematics
Tr7	Female	28	Diploma in Education	6	Shona
Tr8	Female	29	Diploma in Education	6	Physical Education
Tr9	Female	42	BED Special Needs Education	16	Shona
SH1	Female	55	MSc Educational Management	20	Computer Science
SH2	Male	56	Med Philosophy	21	Art
SH3	Male	58	BED Special Needs Education	23	Mathematics

Key: Tr- Teacher; **SH**-School head

Gender

According to the data, two of the teachers were male and the bulk of the seven were female. This may suggest that a disproportionate number of women are pursuing training to become elementary school teachers compared to men. This could be the result of socially established gender roles that assign women the responsibility of taking care of the children. As a result, while male teachers mostly entirely rely on their professional training, these female teachers may be using both their socio-cultural and professional competencies to instruct students. Both may offer benefits and drawbacks when it comes to using situative tactics to teach fraction addition.

Additionally, the data reveals that one of the school heads was female and the other two were male. This may indicate that there is a slow movement toward parity in positions of leadership. This may be the result of efforts made by the government, media, and civil society to promote

gender equality in the workplace and society at large. Less friction in the workplace could lead to more possibilities for focusing on the best teaching practices that will help learners succeed.

Age

According to the data, five teachers out of nine, or the majority, were between the ages of 35 and 45. Because these instructors are middle-aged, they may have a good mix of maturity and experience with the newest methods of teaching addition of fractions. This could indicate a more successful application of situative approaches by these teachers. Four of the teachers were in the age group of 26 to 35, according to the data. This suggests that many teachers are still relatively young and may not be as mature as they may be, but their youth may also indicate that they are more conversant with the most recent situative strategies. Additionally, the data indicates that one of the teachers was 51 years of age or older. This suggests that some of the instructors are somewhat elderly. Even though these educators may be the most mature, it's possible that they are out of touch with contemporary situative methods. Dewali (2023) discovered that primary school instructors who are 41 years of age or older have better classroom management abilities and are more successful teachers overall. Therefore, knowing this information will be important for determining whether or not the teachers are familiar with and have used situative principles.

The data shows too that both the school heads were of the 51 years or older age range. This suggests that these school heads are quite mature and this may mean that they have sound temperament and judgment in their supervision of teachers and overall curriculum implementation. However, it may also mean that the school heads are out of touch with current situative approaches in the teaching of mathematics.

Educational qualifications

The data revealed that the minority of teachers, that is three, have attained a bachelor of Education degree. This suggests that a minority of teachers are entering the profession with or are upgrading to a qualification that is higher than the entry level diploma. This could mean that these teachers possess relatively high competencies in the utilisation of situative approaches to teach mathematics to learners including addition of fractions. The data also shows that six of the teachers hold entry level Diplomas in Education. This suggests that a large number of teachers only possess entry level qualification and therefore, these teachers may not be highly competent in utilizing situative approaches to teach addition of fractions to learners. The data also shows that none of the teachers have attained Master of Education degrees. This suggests that a few of the teachers are upgrading their skills to advanced degrees. This could mean that these teachers may face challenges in using situative approaches in adding grade 3 fractions.

The data also shows that two school heads have attained Master's Degrees and one obtained an Honors Degree. This could imply that the school heads are competent at both managing curriculum implementation as well as supervising teachers' utilisation of situative approaches in the teaching of fraction addition at grade 3 level. According to Hargreaves (2019), identifying teachers who raise their pupils' test scores particularly in mathematics is facilitated by their qualifications. Therefore, the data shows that the teachers possess qualifications that are necessary in the application of situative approaches in teaching addition of fractions at intermediate level.

Work experience

The data shows that most of the teachers, that is, five, have amassed 11 to 15 years' worth of teaching experience. This could suggest that the teacher training that these teachers acquired at

teacher training institutions may be beginning to get old. Dewali (2023) contends that while the evidence does not prove that all teachers will get inept or better with time, it does show that most teachers become more successful over time. Therefore, without the intervention of in-service teacher training, the teachers may no longer be in touch with modern situative approaches to teaching addition of fractions. The data also shows that three of the teachers had amassed 6 to 10 of teaching experience. This may mean that a relatively large proportion of teachers has a sound balance between experience and the freshness of knowledge and competencies acquired at teacher training institutions. These teachers may be highly competent at utilizing situative approaches in teaching addition of fractions to grade 3 learners. The data also shows that one of the teachers had acquired 0 to 5 years' worth of teaching experience. This may suggest that a few of the teachers are still inexperienced but they possess the most current knowledge of situative approaches that could be utilised to teach grade 3 learners addition of fraction. The data also shows that one of the teachers has attained 16 to 20 years of teaching experience. This could imply that a few of the teachers are highly experienced but could now be possessing outdated knowledge on the situative approaches that could be used to teach addition of grade 3 fractions. These teachers are in need of in-service teacher training.

The data also shows that all the three school heads have amassed over 20 years or more of work experience. This suggests that the school heads are highly experienced and this may make them quite competent at supervising curriculum implementation at their respective schools. However, it may also suggest that without the intervention of in-service training, these school heads may be out of touch of the modern situative approaches that could be utilised to teach addition of fractions at grade 3 level learners. This may limit their ability to efficiently supervise teachers in that regard.

Area of Specialization

The data shows that the majority of the participants that is 8 teachers, did not specialize in mathematics but they are teaching addition of fractions at grade 3 level. This could suggest that situative approaches in the teaching of mathematics cannot be successfully utilised. The data also shows that only two teachers specialized in mathematics. The data also showed that two of the school heads did not specialize in mathematics and this could suggest that they may not be aware of the situative approaches that grade 3 mathematics teachers should employ when teaching addition of fractions.

4.3 Teachers' awareness of situative approaches in teaching addition of grade 3 fractions

Table 4.2: Teachers' awareness of situative approaches in teaching addition of grade 3 fractions.

Situative approach	Participants who cited it
Collaborative learning	Tcr1; Tcr2; Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9; SH1; SH2:SH3
Utilizing problem-based learning(project)	Tcr1; Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9; SH2:SH3
Scaffolding	Tcr1; Tcr2; Tcr3; Tcr4; Tcr7; Tcr8; SH3
Reflective question and answer discussions	Tcr2; Tcr4; Tcr5; Tcr6; Tcr9; SH1

Diagrammatic illustrations or visual media	Tcr1; Tcr5; Tcr8; Tcr9; SH3

Applying collaborative learning

All the twelve participants indicated that they were aware that collaborative learning is one of the ways in which the situative approach is applied. According to these participants, in the situative approach, learners should be able to solve fractional problems as groups. For instance, one of these participants had this to say:

When teaching addition of fractions there is grouping of learners into small groups or pairs to work together on fraction addition tasks and activities. Learners collaborate together to solve problems and construct their understanding of concepts, explain their thinking, learn from their peers, and develop a deeper understanding of the topic. (Tr1).

Similarly, another participant had this to say:

When learning addition of fractions, learners usually engage in collaborative activities, group discussions, and peer teaching. This way, learners explain their thinking and articulate their strategies, and learn from one another (Tr4).

Concurring with the comments presented above, another participant said:

From the time these learners are introduced to the concept of adding fraction, learners are mixed with peers and use various tools and representations (e.g., fraction strips, number lines, diagrams) to support their collaborative problem-solving.(Tr7).

The researcher noted from teachers' scheme books too that collaborative methods were routinely applied so as to equip learners with the necessary foundation on addition of fractions. Observation was made from the way learners collaborated as they did their group work assignments. This study found therefore that teachers were mostly aware that utilizing collaborative methods is one significant situative approach at grade 3 level. This finding resonates with that of Robertson et al (2021) who advocated for small groups and peer teaching where learners can freely express themselves thus assisting in the quick grasping of mathematical concepts with addition of fractions included.

Utilizing problem-based learning

The data revealed as well that ten of the participants, among them 8 teachers and two school heads, indicated that they were aware that problem-based learning is one of the significant situative approaches utilised to teach addition of grade 3 fractions. This was expressed by one of the participants in the following comments:

Learners can only train their minds to think critically and logically in the context of problem-based learning. Therefore, providing learners with story problems in particular creates the opportunity and practice of using reasoning to arrive at the correct answer (Tr3).

Echoing similar sentiments, another participant was quoted saying:

It is essential that learners exercise their fractional proficiency within the current competency-based curriculum by solving problems. This is a situative approach whereby learners utilize prior knowledge to solve problems presented in various ways (Tr8).

Another participant, in agreement with the comments presented above had this to say:

It is said that mathematics is a thinking subject because learners are not just fed formulae and answers but have to use prior knowledge and real life experiences to solve fractional problems. This is the most vivid illustration of situative approaches to the teaching and learning of grade 3 fractions (SH3).

The researcher noted too from the teachers' scheme books and learners exercise books that problem-based learning is utilised frequently in adding fractions. The researcher observed too that the board often displayed fraction addition problems that learners had to solve. Also an observation was made on mathematics corners within some of the classrooms visited which had pending assignment requiring learners to complete the projects on adding fraction. The study found therefore that most teachers were aware that utilizing problem-based learning is one of the commonly used situative approaches in the teaching and learning of adding grade 3 fractions. This finding is similar to that of Peterson et al (2019), who also found that teachers mostly utilised problem-based learning as the pre-eminent situative approach. Peterson et al (2019) the problem is first encountered cold without any prior preparation or study. Subsequently, a learner group interacts with each other to explore their existing knowledge as it relates to the problem. The third step is that learners work with the problem in a way that permits his ability to reason

and apply knowledge to be challenged and evaluated appropriate to his level of learning. Finally, learners identify further learning needs in order to make progress with the problem.

Scaffolding

The data showed as well that seven of the participants comprising of six teachers and one school head indicated that they were aware that scaffolding is one of the significant methods of teaching addition of fractions through the situative approach. These participants suggested that learners acquired the ability to reason when teachers build on their prior, less complex knowledge and present to them slightly more complex tasks without first teaching them how to solve them. This was concisely explained by one participant who said:

Usually, it is beneficial that the teacher moves on from teaching how to add fractions, they do not first repeat the prior lesson or lessons but first ask the learners to attempt the tasks and then offer support in line with the real experiences in the learner's surroundings. This is scaffolding. Utilizing what the learner can only do, to help them perform more complex tasks. It nurtures critical thinking (Tr1).

Similarly, another participant had this to say:

In similar topics and where the same techniques and knowledge from an earlier and less complex topic can be applied to a more complex topic, the teacher should let the learner first attempt the tasks on their own and only correct them once they have made errors. This scaffolding enables the learner to develop a capacity for a greater conceptual understanding (Tr2).

Alluding to a similar viewpoint, another participant had this to say:

Where applicable, learners are taught through scaffolding in fractions addition so that they develop a mathematical proficiency. Vygotsky's zone of proximal knowledge is quite relevant in the teaching and learning of mathematics at grade 3 level (Tr8).

The research gleaned from teachers' lesson plans too that they often utilised learners' prior knowledge to introduce a new but related topic without much prior teaching in adding fractions. This is a form of scaffolding could develop learner's conceptual understanding in addition of fractions. An observation was made as some of the facilitators offered assistance and guidance to learners with conceptual grasping difficulty. The study found therefore that most teachers were aware that scaffolding is one of the situative approaches that could be utilised to teach addition of fractions at grade 3 level.

Reflective question and answer discussions

The data also revealed that only six of the participants, among them five teachers and one school head indicated that they were aware that reflective question and answer discussions were among the situative approaches utilised to teach addition of grade 3 fractions. For instance, one of these participants was quoted saying:

It is essential that teachers give learners the opportunity to explain their approaches to solving a problem through discussion. This enables the learners to nurture a reasoning ability in their computations or problem solving (SH1).

Echoing similar sentiments, another participant had this to say:

Sometimes learners think more clearly when they are asked to describe each step of their problem solving when adding fractions. This, in my view, creates a more conscious and meticulous mathematician in the learner (Tr5).

Alluding to a similar viewpoint, another participant said:

I think, as a teacher, you can identify which learners are simply cramming addition of fractions facts and processes and which learners are acquiring vivid conceptual understanding of fraction addition by asking those questions and helping them explain their problem-solving methods (Tr9).

The researcher observed too that during fraction additions lessons, some of the teachers would from time to time ask learners to illustrate problem solving on the board and explain or describe the steps that they would be taking. The schemes of work also showed that learning activities incorporated question and answer sessions. The study found therefore that few of the teachers were aware that Reflective question and answer discussions is one of the situative strategies that may be utilised to teach addition of fractions at grade 3 level. This finding is in contrast to that of Hlabati (2020) who also discovered that reflective question and answer or discussion with learners is another situative technique that teachers utilised in mathematics when teaching addition of fractions

Diagrammatic illustrations or visual media

The data showed too that only five participants, 4 of whom were teachers and one school head, indicated that they were aware that diagrammatic illustrations were one of the strategies utilised

in the situative approach to teaching addition of fractions at grade 3 level. According to these participants, it is important that learners do not acquire mathematical understanding only from the abstract but diagrammatic illustrations so that they can better use the logic of what they have seen to answer questions or solve problems. This was particularly stressed by one participant who had this to say:

When certain mathematical facts are presented to learners diagrammatically, they become more vivid and these learners can better utilize the knowledge of what they would have observed to answer questions. For instance, I have often found that when fractions are presented diagrammatically at first, learners have a better understanding of fractions. So much so that even when questions are eventually posed to them without the aid of diagrams, they can picture the fractions in their head (Tr1).

Concurring with the comments presented above, another participant was quoted saying:

Learners can get a more vivid sense of direction, time, scale, size and so on when these are resented through images and various visual media. The learning is less abstract and the learners can mentally picture certain additions in fractions, symbols and facts. This eventually helps them solve fraction problems as well as apply it in real situations (Tr8).

Alluding to a similar viewpoint, another participant said:

A learner that has seen a rectangle in an image for example, can better recall certain facts about the rectangle such as the fact that the parallel sides of a

rectangle are the same length or width. Therefore, when the learner is presented with just the one length and the one width for example, they can calculate the perimeter because they have a mental picture of how many sides a rectangle has (SH3).

The researcher observed too that various images to help learners more vividly understand adding grade 3 fractions are displayed in some classrooms at the schools that were studied. The researcher noted too from some of the teachers' lesson plans that the utilisation of visual media is regularly planned for and utilised in fraction lessons. The study found therefor that only a few teachers were aware that the use of diagrammatic illustrations or visual media is one of the basic strategies utilised in the situative approach to teaching addition of fractions at grade 3 level. This finding is in contrast to that of Hobane (2020) who also determined that teachers utilised diagrammatic illustrations to teach learner innate mathematical facts then they could reason from those facts. Hobane (2020) found that, in teaching fractions, teachers would utilize diagrammatic illustrations to help learners understand adding fractions with the same denominator.

4.4 How are the challenges encountered in the implementation of situative perspective be minimized?

Table 4.3. How are the challenges encountered in the implementation of the situative perspective be minimized?

Strategy	Participants who cited it
Individualized learning	Tcr1; Tcr2; Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9;

	SH1; SH2:SH3
Provide ongoing professional development	Tcr1; Tcr2; Tcr3; Tcr4; Tcr5; Tcr7; Tcr8; Tcr9; SH1; SH2
Careful planning and improvisation	Tcr1; Tcr2; Tcr3; Tcr4; Tcr6; Tcr7; Tcr8; Tcr9; SH3
Use a combination of approaches	Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9; SH1

Individualized learning

All twelve participants indicated that one of the significant strategy to cab challenges to the utilisation of situative approaches when adding grade 3 fraction is by adopting individualized teaching and learning. These participants suggested that learners come from various backgrounds and their readiness to learn may also differ so it is important to use methods that suits each learners needs to grasp the concept of adding fractions. One of these participants was quoted saying:

Sometimes teacher's needs to teach addition of fractions in a way that each and every learner is comfortable with, Offer flexible grouping options and provide differentiated support or extensions as needed.(Tr5).

Concurring with the comments presented above, another participant had this to say:

Individualized learning is the best strategy to overcome a number of challenges in the application of situative approaches in the teaching of adding grade 3 fractions. I have observed a number of grade 3 teachers, they usually utilize a variety of representations, manipulatives, and scaffolding strategies to cater to different learning styles. (SH1).

Similarly, another participant had this to say:

In certain cases, teachers here collaborate with special education professionals to ensure appropriate accommodations are made thus differentiating learner needs when teaching addition of fractions (SH2).

The researcher observed too in the teachers scheme books and learners written exercise books that a variety of situative approaches are being applied to different learners. This study found therefore that individualized learning is a powerful solution to minimize the challenges faced in the implementation of situative approaches in the teaching of addition of grade 3 fractions. This finding is similar to that of Neiser et al (2023) who also found varying differentiating teaching strategies according to each learners needs is vital for conceptual grasping. The study determined that as a result, most teachers do plan to apply a tactful balance of these approaches to cater for individual differences in learners.

Provide ongoing professional development

The data revealed that among the twelve participants, eight teachers and two school heads, indicated that inadequate in-service teacher training is also one of the challenges hindering the effective utilisation of situative approaches to teach addition of Grade 3 fractions. Thus, they proposed a provision of ongoing professional development opportunities for teachers. This was most concisely put across by one participant who had this to say:

Some of the teachers have been teaching for 15 to 20 years and the only training they received in that tome was at teacher training colleges long ago. Their knowledge and competencies could now be outdated and they may not be aware of

the situative approaches that have been established over the course of time so they need some refresher courses (SH2).

Alluding to a similar viewpoint, another participant was quoted saying;

Knowledge evolves over time and so do teaching approaches. Teachers need to be constantly re-appraised of the last teaching approaches particularly when the curriculum transitioned from being content based to being competency based. (Tr4).

Sharing agreeable sentiments, another participant said:

The lack of regular in-service teacher training causes us to be overtaken by new information, new knowledge and new technologies that could be utilised as situative approaches in teaching addition of grade 3 fractions (Tr8).

The researcher noted too from biographical data that many of the teachers had at least ten years of teaching experience, therefore given that these teachers may not be getting adequate in-service teacher training, their ability to utilize situative approaches in teaching addition of fractions may be limited. The observation from the schemes of work and lesson plans showed that some teachers do not have recent pedagogies within the situative perspective. The study found therefore that most teachers and heads need professional development on the concept of fractions as well as effective situative methods in the teaching of grade 3 learners to conceptualize addition of fractions... This finding resonates with that of Copur-Gencturk (2020) who also established that when teachers are provided with regular in-service teacher training, they get in

touch with modern situative approaches that could be utilised in teaching addition of grade 3 fractions.

Careful planning and improvisation of learning resources

The data also shows that nine of the participants, comprising of 8 teachers and one school head, indicated that insufficient teaching and learning resources were also affecting the efficient utilisation of situative approaches in teaching addition of grade 3 fractions. Thus they indicated that careful planning can minimize this challenge. These participants indicated that since visual media enhanced situative approaches to addition of fractions, improvisation of learning resources using the locally available resources is of much importance. This was particularly stressed by one participant who had this to say:

For grade 3 learners to understand some addition of fractions facts, these facts have to be presented to them through various forms of media. Unfortunately, our range of media is quite limited thus a situative teacher need to gather local resources to aid learners visually (Tr1).

Alluding to a similar viewpoint, another participant had this to say:

The learners do not have access to interactive electronic devices that could have been very helpful. We as teachers need to plan lessons in time carefully and at all cost use concrete media from the items learners use even at home to contextualize the adding of fractions (Tr6).

Similarly, another participant had this to say:

Addition of fractions at grade 3 level needs a lot of visual media that is relevant to learner experience for them to grasp so preparation is needed and also using the available resources like phones and computers at the school (SH3).

The researcher observed as well that there were limited technological resources at the schools that were studied but teachers improvised the local resources to provide concrete learning for example adding ingredients to bake a local soya bread. The researcher noted from inventory record too that such resources as computers were very few and in other schools not there at all so careful planning and improvisation was observed in lessons. The study found therefore that one of the significant strategy to cab the challenge of limited resources is improvisation and timeous planning. This finding is in sync with that of Rothman and Summons (2019) who also found that situative approaches can be aided by technological resources, for instance, the visual projection of parts of a fraction to be added can be improvised using local resources

Use a combination of approaches

The data revealed as well that eight participants comprising seven teachers and one school head, indicated that teachers' over reliance on a single approach is one of the challenges being encountered in teaching addition of grade 3 fractions. According to these participants, there is need to blend these approaches so as to create a full conceptualization of the concept as no approaches lakes disadvantages. This was explained by one participant in the following comments:

Learners can not only learn by reasoning; they also need constant practice and group work in real life situation problems. They also need to be scaffold a lot of the fractional knowledge; they cannot acquire on their own. Therefore, situative

approaches are only useful when used in combination with other approaches.
(Tr3).

Alluding to a similar viewpoint, another participant said:

Sometimes teachers rely too much on a single approach and this has the tendency to erode the usefulness of the situative approach because learners also need to learn by doing and collaboration. Therefore, a number of approaches among situative approaches must be blended for example question and answer as well as group work can be blended in one lesson **(SH1).**

Concurring with the comments presented above, another participant was quoted saying:

*The failure by teachers to tactfully alternative and blend the various teaching approaches means that the situative approaches are either restricted or are not as useful as they could be because either are not used in combination with other approaches***(Tr3).**

The researcher noted from both observation and document analysis that sometimes teachers use a variety of teaching methods within the situative perspective in a single lesson. The study found therefore that the challenge of the tendency by teacher to rely too heavily on a single approach can be minimized by blending a number of situative approach to compliment weakness of each strategy. This finding is relatable to that of Renga et al (2020), who said that learners cannot learn from abstract concepts alone nor can they learn from practical work alone but there has to be a healthy balance between situativity in the classroom.

4.5 Why are situative approaches effective in the teaching and learning addition of grade 3 fractions

Table 4.4 why are situative approaches effective in the teaching and learning addition of grade 3 fractions

Reason why	Participants who cited it
Enhanced problem-solving skills among learners	Tcr1; Tcr2; Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9; SH1; SH2;SH3
Active engagement and collaboration	Tcr2; Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9; SH1; SH2;SH3
Enhances conceptual understanding	Tcr1; Tcr2; Tcr3; Tcr4; Tcr5; Tcr6; Tcr7; Tcr8; Tcr9; SH3
Elevated memory retention	Tcr1; Tcr3; Tcr4; Tcr5; Tcr6; Tcr8; Tcr9; SH1; SH3

Enhanced problem-solving skills among learners

All twelve of the participants indicated that one of the significant impacts of the rationalist approach in teaching mathematics at junior level is that it enhances the learners' problem-solving skills. This was concisely explained by one participant who was quoted saying:

Situative approaches challenge students to engage in authentic problem-solving tasks, where they must analyze problem situations, select appropriate strategies, and justify their reasoning. (Tr3).

Echoing similar sentiments, another participant had this to say:

The emphasis on problem-solving prepares students to be better equipped to handle complex, real-world fraction addition challenges.

(Tr6).

Similarly, another participant said:

When learners have an improved ability to make mathematical sense out the various problems presented to them, the likelihood that they will arrive at the correct answer is much higher (Tr7).

The researcher noted too from many of the exercise books and teachers' learner assessment reports that most of the learners solve problems better when situative approaches are utilised rather than when only transmission or imperialist approaches are used. The study found out that this is so because situative approaches leads to enhanced problem solving among learners. This finding supports that of Sizoka (2020) who also found that because situative approaches learning enhance their knowledge acquisition skills by developing critical thinking, learners ultimately acquired proficiency in problem solving.

Active engagement and collaboration

The data revealed as well that eleven of the participants, comprising eight teachers and three school head, indicated that situative approaches in the teaching of fraction addition at grade 3 level is effective because it fosters active engagement and collaboration amongst learners . This was explained by one participant in the following comments:

When learners are put in group for example they are motivated to contribute especially when the group members are of their social circle and the concept being related to their experiences. This will foster active participation that results in conceptualizing addition of fractions (Tr2).

Similarly, another participant was quoted saying:

Peer teaching and group work enhances collaboration and pool of ideas as learner learn from each other's experience. This way learning becomes interesting and the objective of adding fractions will be achieved smartly (Tr4).

Alluding to a similar viewpoint, another participant had this to say:

The social nature of these approaches fosters a deeper understanding of fraction addition concepts as students engage in discussions, share strategies, and collectively construct knowledge (Tr6).

The researcher observed from teachers' learner assessments reports too that the learners tended to exhibit evidence of active engagement and collaboration when situative approaches to the teaching of grade 3 addition of fractions are utilised. The study found therefore that another significant reason why situative approaches are effective in addition of grade 3 fractions is that it helps teachers with authentic assessment. This finding is akin to that of Pretorius (2018) who also found that learner active engagement and collaboration is much higher when situative approaches are utilised. As such, Pretorius (2018) concluded therefore that because situative approaches nurture critical thinking, they help learners become more active and collaborative in the learning process

Enhances learners' conceptual understanding

The data revealed as well that ten of the participants, comprising all nine teachers and one school head indicated that situative approaches are effective in teaching addition of grade 3 fractions because it significantly enhance learners' conceptual understanding. For instance, one of the participants said:

I find that when learners are taught with situative approaches as one of the methods, they are more, they understand the concept easily. Situative approaches emphasize the development of conceptual understanding, rather than just procedural skills, in the learning of fraction addition.

(Tr1).

Similarly, another participant had this to say:

This conceptual understanding enables students to apply their knowledge flexibly in a variety of contexts, rather than just memorizing algorithms or procedures (Tr7).

Alluding to a similar viewpoint, another participant was quoted saying:

Usually, learners that embrace the situative approach have a more intrinsic understanding of and atomicity in the working of fraction addition problems or tasks. Therefore, by providing opportunities for students to create and use their own models, representations, and problem-solving strategies, they develop a stronger grasp of the underlying concepts and principles.
(SH3).

The researcher noted from teachers' learner assessment reports that when situative approaches are utilised, this often results in the learners' being more accurate in their computation which is

evidence of conceptual understanding. The study found therefore that one of the reason why situative approaches are effective in teaching addition of grade 3 fractions is that of enhanced conceptual understanding. This finding resonates with that of Maseru and Modhimo (2019) who also established that situative approaches enhance concept grasping in solving mathematical problems and therefore learners would be more accurate in their computation and apply its relevance in everyday activities

Elevated memory retention

The data showed too that nine of the participants, among them seven teachers and two school heads, indicated that situative approaches are effective in teaching grade 3 fractions because it elevates memory retention. This was elaborately expressed by one participant who had this to say:

When the learner is not just a passive encoder of information but thinks critically on that information, they are more likely to remember it. Situative approaches focus on embedding fraction addition concepts within real-world, contextual problems and situations that are meaningful and relevant to students' lives. (Tr 3)

Echoing similar sentiments, another participant was quoted saying:

Students are more motivated to learn and apply fraction addition skills when they can see the relevance and importance in their everyday experiences and therefore chances are much higher that they will not forget content acquire that way (Tr8).

Similarly, another participant said:

Situativity involves a deeper engagement with the content than when the material is simply spoon fed to the learner. Therefore, with such intimate engagement, the learner is likely to remember most of the content very well because they have a deeper cognitive awareness of the content (Tr9).

The researcher gleaned from the record books of teachers and learner assessment reports that during periodic and termly tests, learners tend to do well in topics that were taught through situative approaches. This indicates a higher recollection among learners when situative approaches are utilised. The study found therefore that another significant reason for a positive impact of situative approaches when teaching addition of grade 3 fractions is that learners acquire enhanced memory retention. This finding bares resemblance with that of Leong et al (2019) who also established that one of the most prominent reasons why situative approaches benefit learners to add fractions was that it enhanced the memory retention. According to Leong et al (2018), when learners are taught to apply addition of fractions in real situations, their cognitive abilities are enhanced and their proficiency at remembering taught concepts is much higher.

4.6 Summary

This chapter presented, analyzed and discussed research findings. The chapter first presented and analyzed the biographical data of participants. Subsequently, the chapter presented, analyzed and discussed key research findings on the thematic areas of the research questions, that is: teachers' awareness of situative approaches in teaching addition of fractions at grade 3 level; how are the challenges faced in the utilisation of situative approaches can be minimized; and why situative approaches are effective in teaching addition of grade 3 fractions.

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

5.1 Introduction

This chapter provides a summary to the study and its findings. Subsequently, the conclusions that were drawn from the results are listed. The chapter then proffers recommendations that if implemented may enhance the utilisation of situative approaches in teaching addition of grade three fractions.

5.2 Summary of the study

In the first chapter, the study explored the addition of Grade 3 fractions using a situative perspective in Chinhoyi District. This chapter provided a background of the study detailing the history of the problem under investigation. The chapter also provided a statement of the problem. The research questions that the study sought to ultimately answer were listed. Subsequently, the

significance of the study was outlined. The chapter then presented the delimitation, limitations and finally definition of terms was provided.

The second chapter of the study reviewed literature related to the study. The chapter first discussed the situative perspective and fraction conceptualization model. It served as the study's theoretical foundation. The study will then examined previous research on the subject areas covered by the research questions, that is: What situative approaches are Grade three teachers aware of in the teaching of addition of fractions? How are the challenges encountered in the implementation of situative perspective methods be minimized? and Why are situative approaches effective in the teaching and learning addition of fractions at Grade three level?

The third chapter discussed the research methodology that was utilized to explore the teaching and learning of Grade 3 fractions using a situative perspective at three primary schools in Chinhoyi District. Specifically, the chapter discussed the interpretivist research paradigm, the qualitative approach and the phenomenological research design. Subsequently, the chapter presented the study population, sample size and sampling techniques. The methods of collecting data, that is, in-depth interviews and document analysis were outlined too. The methods of data presentation and analysis as well as methods of ensuring trustworthiness of data were presented. Finally, the chapter discussed the ethical considerations that were made.

The fourth of the study presented, analyzed and discussed research findings. The chapter first presented and analyzed the biographical data of participants. Subsequently, the chapter presented, analyzed and discussed key research findings on the thematic areas of the research questions, that is: teachers' awareness of situative approaches in teaching addition of fractions at

grade 3 level; how are the challenges faced in the utilisation of situative approaches can be minimized; and why situative approaches are effective in teaching addition of grade 3 fractions.

This fifth and final chapter provides a summary to the study and its findings. Subsequently, the conclusions that were drawn from the results are listed. The chapter then proffers recommendations that if implemented may enhance the utilisation of situative approaches in teaching addition of grade three fractions.

5.2.1 Summary of research findings

The study made the following findings:

- ✓ All the twelve participants indicated that they are aware that collaborative learning is a strategy in which a situative perspective is applied.
- ✓ Most, that is, ten of the participants, among them eight teachers and two school heads, indicated that they were aware that problem-based learning is one of the significant situative approaches utilised to teach addition of grade 3 fractions.
- ✓ The majority that is seven of the participants indicated that they were aware that scaffolding is a situative approach in the teaching of fraction addition.
- ✓ An average of six participants comprising of five teachers and one school head indicated that they were aware that reflective question and answer is a strategy in which addition of fractions at grade three level is being taught.
- ✓ The least number of participants, among them four were teachers and one school head showed that the use of diagrammatic illustration or visual media was one of the strategies utilised in the situative perspective to teach addition of grade three fractions.

- ✓ All the twelve participants indicated that individualized learning is one of the significant strategies to minimize the challenges encountered in the utilisation of situative approaches in teaching addition of grade 3 fractions
- ✓ Most, that is ten of the participants comprising of eight teachers and two school heads indicated that providing ongoing professional development is a way to minimize the challenges encountered in the implementation of the situative perspective to teach addition of grade 3 fractions.
- ✓ The majority, that nine of the participants, among them eight teachers and one school head indicated that careful planning and improvisation is a way to reduce the challenges faced when teaching addition of grade 3 fraction in the views of a situative perspective.
- ✓ Most that is eight participants among them are seven teachers and one school head indicated that the use of a combination of approaches is one of the ways how the challenges encountered in the utilisation of situative perspective in the teaching of adding grade three fractions.
- ✓ All of the twelve participants indicated that situative approaches are effective when teaching addition of grade fractions because they enhance problem solving skill among learners.
- ✓ The majority, that is eleven participants comprising of eight teachers and three school heads indicated that situative approaches are effective in the teaching of grade 3 addition of fractions because there is active engagement and participation of learners.
- ✓ Most, that is ten participants, among them all nine teachers and one school head pointed out that situative approaches enhance conceptual understanding and this is why they are effective in teaching addition of grade 3 fractions.

- ✓ Most, that is nine participants composed of seven teachers and two school heads indicated that situative approaches are deemed effective in the teaching of grade 3 fraction because of elevated memory retention.

5.3 Conclusions

In view of the findings made, the study arrived at the following conclusions for each of the thematic areas of the research questions:

5.3.1 Teachers' awareness of situative approaches in teaching addition of grade 3 fractions.

Teachers' awareness of situative approaches in teaching addition of grade 3 fractions is moderate. This is because it was evident that most teachers were only aware of three forms of situative approaches in teaching addition of fractions grade three level. These were: collaborative learning; utilizing problem-based learning; and scaffolding. The study concluded too that a few of the teachers knew of other forms of situative approaches in the teaching of grade three addition of fraction. These included: reflective question and answer discussions; and diagrammatic illustrations or visual media.

5.3.2 How are the challenges being faced in the utilisation of situative approaches be minimized

There are a number of strategies which can be used to minimize the challenges faced in the utilisation of situative approaches when teaching addition of grade 3 fractions. These include promoting individualized learning, provide ongoing professional development for facilitators,

Careful planning and improvisation and the use of combined approaches within the situative perspective.

5.3.3 Why are situative approaches effective in teaching addition of grade fractions

Situative approaches are effective to the teaching of grade three addition of fractions because of several reasons. For instance, situative approaches lead to enhanced problem-solving skills among learners; leads to active engagement and participation of learners; enhance learners' conceptual understanding; and lead to elevated memory retention.

5.4 Recommendations

Against the backdrop of conclusions arrived at, this study proffers the following recommendations:

The Ministry of Primary and Secondary Education (MOPSE)

- The Ministry must provide regular in-service teacher training so that teachers remain in touch with modern situative approaches in the teaching of grade three addition of fractions.

School administrators

- School administrators in conjunction with School Development Committees (SDCs) must strive towards the provision of all modern and traditional resources to facilitate the effective utilisation of situative approaches in teaching addition of grade three fractions.

Teachers

- Teachers are encouraged to familiarize more with the latest situative approaches and tactfully utilize them in combination with other approaches.

Civil society

- Civil society organizations must support schools with resources and in-service teacher training to enhance the capacity for effective utilisation of situative approaches in the teaching of fraction addition at grade 3 level.

Parents

- Parents are encouraged to augment the efforts of teachers in the home by also utilizing situative approaches in assisting learners with homework and contributing to the resources that their children need to learn mathematics.

REFERENCES

- Abbas, H, J. (2020). Mathematical Fundamentals at Foundational Phase. Journal of STEM Education, 23 (14) 356-377.
- Akhtar, I. (2021). Research Design, Thousand Oaks, SAGE Publications.
- Alharahsheh, H. and Pius, A. (2020). A review of key paradigms: Positivism vs. Interpretivism. Global Academic Journal of Humanities and Social Sciences, 2(3), 39-49
- Babajide, F, David C and Adesina, P. (2022). Data presentation and analyzing. LASU International Conference, Buadi.

Boud, C and Felletti, O. (2019). Challenges Encountered by Primary School Learners in Mathematics. *Journal of Educational Psychology*, 24 (7) 509-527.

Burnard, S, Gill, G, F, Stewart, R, Treasure, O and Chadwick, E. (2020). *Social Research Methods: Qualitative and Quantitative Approaches* (7th Ed.). Allyn and Bacon. USA

Casteel, A and Bridier, N. (2021). Describing Populations and Samples in Doctoral Student Research. *International Journal of Doctoral Studies*. 16. 339-362.

Copur-Gencturk, Y. (2021). Teachers Conceptual Understanding of Fractions Operations: Research from National Sample of Elementary School Teachers. *Journal of Mathematics*. 107: 525-545.

Copur-Gencturk, Y., & Olmez I. B. (2020). Teachers' attention to and flexibility with referent units: Proceedings of the 42nd Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Mexico (pp. 772–780).

Cortina, J., Visnovska, J., Graven, M. & Vale, P., 2019, 'Instructional design in pursuing equity: The case of the "Fraction as Measure" sequence', i: Promoting research-based opportunity for all: Proceedings of the 27th Annual Conference of the Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE), Durban, January 15–17

Creswell, J, W. (2023) *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (2nd Ed.). Thousand Oaks, CA: SAGE.

Crawford, L. M. (2020). Conceptual and theoretical framework in research. *Foundation in Research Design*, Sage Publication Inc., 1, 35-48

Dewali, J. (2023). Experience and Education. N.Y Collier Books. New York.

Fendi, E, R. (2021). Scaffolding as a Teaching Strategy in Mathematics. Journal of Educational Psychology, 34 (5) 99-121.

Gorsky, M., & Mold, A. (2020). Documentary analysis. Qualitative Research in Health, Care, 83-90

Gobert, J., & Van Dooren, W. (2019). A challenge in the learning and teaching of fraction addition and subtraction. Springer, Dordrecht.

Hargreaves, A. (2019). Changing teachers, changing times. Cassell. London.

Harish, K.T. (2021). Research Methodology in Social Sciences, Covet, New Dehli.

Hlabati, J, M. (2020). Evaluating Teacher Approaches and their Impact on Learners' Achievement in Mathematics at Selected Schools in Mpumalanga Province, South Africa. A Thesis Presented to the University of Kwazulu Natal in Partial Fulfilment of a Master of Education in Educational Psychology.

Hobane, R. (2020). Teaching Critical Thinking in Primary School Mathematics. Journal of Mathematical Innovation, 34 (7) 87-112.

Hobard, R. (2020). Critical Thinking as a Mathematical Skill. Journal of Educational Competencies, 11 (12) 652-677.

Hossan, D, Mansor, Z and Jaharud, N. (2023). Research Population and Sampling in Quantitative Study. International Journal of Business and Techno-preneurship (IJBT). 13. 209-222.

Irshaidat, R. (2019). Interpretivism vs. Positivism in Political Marketing Research.

Journal of Political Marketing, 1-35

Izsak, A., Jacobson, E., & Bradshaw, L. (2019). Surveying middle-grades teachers' reasoning about fraction arithmetic in terms of measured quantities. *Journal for Research in Mathematics Education*, 50(2), 156–209

Jasien, L and Gresalfi, M (2021). The Role of Participatory Identity in Learners. *Journal of Learning Sciences*, 30(4-5), 676-706

Leong, Y., Baniqued, R., & Yow, J. (2019). What instructional approaches have teachers used to support their students in learning fraction addition? *Asia-Pacific Journal of Teacher Education*, 47(5), 532-552.

Lehman, J., Capraro, R., & Lai, M. (2019). Learning and teaching addition of fractions. *ZDM Mathematics Education*, 51(1), 5-16. Lengerich, Germany.

Kuponda, R, P. (2019). Teacher Experiences in Introducing New Mathematical Concepts to Junior Level Learners. *Southern Africa Journal of Science Education Research*, 34 (17) 764-799.

Lave, J. (2019). *Learning and Everyday Life. Access, Participation and Changing Practice*, Cambridge University Press

Lenqvist, J. (2020). *Hands on Approach to the Teaching of Mathematics*. London. Longman.

Lincoln and Guba (2021). *Qualitative Research in Sociology*, New Delhi, Sage Publications.

Long C. (2021). Mathematical, Cognitive and Didactic Elements of the Multiplicative Conceptual Field Investigated Within a Rasch Assessment and Measurement Framework. Unpublished PhD Thesis. Cape Town: University of Cape Town.

Lovemore, T.S., Robertson, S-A. & Graven, M., 2021, 'Enriching the teaching of fractions through integrating mathematics and music', South African Journal of Childhood Education 11(1), a899.

Maseru, L and Modhimo, K, P. (2019). Nurturing Critical Thinking as a Problem-Solving Skill in Mathematics. Journal of Pedagogical Interventions, 34 (5) 765-788.

Neiser, E, Wright, W.E and Capraro, R.M. (2023). Teaching Fractions: Strategies used for Teaching Fractions to Middle Grade Students, Routledge, London.

Okparo, O. (2021). The Evolving Epistemological Foundations in the Teaching of Primary School Mathematics in Kenya. Journal of Educational Management, 27 (8) 309-332.

Peterson, H, Jacob, K and Smith, F, D. (2019). Scaffolding in Mathematics. California. McGraw Hill.

Potter, E. (2019). Qualitative Research in Special Education Needs. Thousand Oaks CA: Sage.

Rothman, M., & Sammons, D. (2019). An additive view of teaching and learning fraction addition. Proceedings of the 41st Annual Meeting of the North American Chapter of the International Group for the Psychology

Salawu, R.O, Bolatitio, I and Masibo, S. (2023). Theoretical and Conceptual Framework in Research: Conceptual Clarification, European Chemical Bulletin.

Schunk, D.H. (2020). Learning theories: An Educational perspective. (8th Ed.). University of New York.

Renga, I.P, Peck, F.A, Feliciano, R, Ericson, D and Wu, K (2020). Doing Maths and Talking School Teacher Identity and Community. Mathematics and Education, 55-89

Robertson, K, Smith, V and Fendi, A, C. (2021). Approaches to Teaching Primary School Learners Mathematics: A Theoretical Analysis. Oxford. Oxford University Press.

Satapathy, S. (2023). Observation as a tool for collecting data. Suchantha Publications, Andhra Pradesh India

Sizoka, T. (2020). Problem Based Learning: Approaches and Concepts. Journal of Science Education, 10 (33) 801-832.

Taherdoost, H. (2021). Data Collection Methods and Tools for Research; A Step-by-Step Guide to Choose Data Collection Technique for Academic and Business Research Projects, International Journal of Academic Research in Management, 10(1), 10-38.

APPENDICES

Appendix A :Ethical Clearance

Permission to conduct the research

Appendix B : Research Instruments

INTERVIEW GUIDE FOR A TEACHER

SECTION A

1. Gender.....
2. Age.....
3. Educational qualifications.....
4. Teaching experience.....
5. Area of specialization

SECTION B: Situative Approaches

6. How do you teach your Grade 3 learners to conceptualize addition of fractions?
7. What situative approaches are you using in the teaching of addition of fractions to grade 3 learners?

SECTION C: Challenges encountered in the utilisation of Situative Approaches and how to minimize them

8. What challenges do you encounter in the utilisation of situative approaches in teaching addition of fractions at Grade 3 level?
9. How do you minimize the challenges?

SECTION D: Why are Situative Approaches effective?

10. Why are situative approaches effective to grade 3 learners' performance in adding fractions

INTERVIEW GUIDE FOR A SCHOOL HEAD

SECTION A

1. Gender.....
2. Age.....
3. Educational qualifications.....
4. Teaching experience.....
5. Area of specialization

SECTION B: Situative Approaches

6. How do you teach learners to conceptualize addition of fractions?
7. What situative approaches are you aware of in the teaching of addition of fractions to grade 3 learners?

SECTION C: Challenges encountered in the utilisation of Situative Approaches and how to minimize them

8. What challenges do you encounter in the utilisation of situative approaches in teaching addition of fractions at grade 3 level?
9. How do you minimize the challenges?

SECTION D: Why are Situative Approaches effective?

10. Why are situative approaches effective to grade 3 learners' performance in adding fractions?

Observation guide

Observation item (Checking for adequacy and quality)	Observations made	Comments
Teaching methods		
Internet facilities		
Nature of teaching and learning		

Document analysis guide

Documents	Observations made	Comments
National Syllabus		
Scheme cum plans		
Test Record books		

APPENDIX C; PLAGARISM SIMILARITY INDEX