

**BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF MATHEMATICS AND SCIENCE**



**THE RELEVANCE OF MATHEMATICS EDUCATION IN THE DEVELOPMENT
OF LIFE SKILLS AT SECONDARY SCHOOL STUDENTS.**

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MATHEMATICS.**

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APPROVAL FORM

The undersigned certify that they have supervised, read, and recommended to Bindura University of Science Education for acceptance of a research project entitled “The relevance of mathematics education in the development of life skills at secondary school students” submitted by Mazhero Ozias in partial fulfillment of the Bachelor of Science Education Honors Degree in Mathematics requirement.

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I declare that this is my work, that all work of other people has been duly acknowledged, and that this work has not been previously presented at this University or any other University for similar purposes.

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Date:

DEDICATION

I want to dedicate this project to my family for the unwavering moral support they gave me during the time of conducting the study.

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ABSTRACT

The research sought to find the relevance of Mathematics education in the development of life skills. In Chapter 1 the researcher highlighted the background of the study which pointed out how mathematics teaching impacts on the development of life skills. The background was followed by the Problem statement. The objectives of the study were to determine the life skills that can be gained by learners in secondary schools through mathematics education, to examine the effect of mathematics education on the development of life skills, to examine factors that pose challenges for the acquisition of life skills and to offer a solution to the challenges of acquisition of life skills. The second chapter reviews the literature on the development of life skills through mathematics. Literature presented reveals the life skills that can be acquired by the teaching of mathematics. Challenges faced in developing life skills through mathematics were indicated as well as intervention methods where different authors brought out excellent ideas of assisting learners which would totally improve development of life skills through mathematics. In chapter 3, the researcher discusses about the research methodology where he talks about the design he used in this research. This goes on to define the population used in this study as well as explaining why he chose this population. It also discusses about the sample used, including the size of the sample as well as the sampling procedure used in this research clearly outlining the procedures taken to come up with the sample chosen from the population. In chapter 4, the researcher presents all the data he collected in the form of tables. The data is then analysed and discussion of the findings acquired through the teachers' questionnaires and the pupils' interview. Here each research question's responses generated from the questionnaires and interview guides are tabulated. All these responses are also analysed and conclusions are drawn. Discussion of the findings was done in chapter 5.

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CHAPTER 1: INTRODUCTION

Introduction

This chapter focuses on the background of the problem sub-problems, the significance of the study any assumptions the researcher has made, the limitations and delimitations of the study, and conclusions. The background of the study is discussed in the next section.

1.1 Background of Study

Mathematics Education in Zimbabwe has come a long way. In the traditional society, before the introduction of formal education, mathematics was used mainly in taking stock of daily farming and trading activities. Most traditional societies have their number systems which were either base five or twenty. These could be seen in their market days and counting systems. However, the coming of the missionaries introduced formal (or Western type) education to Zimbabwe. In this system of education, mathematics occupied a central position in the school curriculum. This has remained the position in the Zimbabwean education system today. In this system, mathematics is a core subject from the primary through the junior secondary to the senior secondary school levels of the educational system.

This important position occupied by the subject in the school curriculum is borne out of the role of mathematics in scientific and technological development, in national building. As Baiyelo (2017) observes, mathematics is widely regarded as the language of science and technology. This observation was also made by Abiodun (2019) when he stated that while science is the bedrock that provides the spring board for the growth of technology, mathematics in the gate and key to the sciences. Ukeje (2021) in acknowledging the importance and contribution of mathematics to the modern culture of science and technology stated that

“without mathematics there is no science, without science there is no modern technology and without modern technology there is no modern society. In other words, mathematics is the precursor and the queen, of science and technology and the indispensable single element in modern societal development”. Mathematics, education is therefore indispensable in nation building.

Since the introduction of formal education in Zimbabwe, mathematics education has gone through several developments. From the era of formal Arithmetic, Algebra, Geometry and the likes through the period of traditional mathematics and the modern mathematics controversy to the present everyday general mathematics. These changes have always been necessitated by the realization of the role mathematics should play in the nation’s scientific and technological development as well as responses to societal needs and demands (Aguele, 2022). The World today is aptly regarded as a global village, characterized by computer and information technology. This age has brought with it lots of sophistication in mathematics to be able to sustain these developments.

The relevance of mathematics education in the development of life skills cannot be overemphasized in view of its application to human everyday life activities (Sunday, Akamu & Fajemidagba 2014). Mathematics is an essential discipline that is recognized as a tool for solving everyday problems faced by individuals.

Mathematics is an important subject as knowledge of it enhances a person’s reasoning, problem-solving skills, and in general, critical thinking. Oviawe (2010) observes that Zimbabwe like most developing nations of the world is faced with a myriad of problems and hearse realities which include unemployment, poverty, conflicts, and diseases. These situations pose great challenges to the very existence of individuals in most developing nations thereby,

calling for the training of educated men and women who can function effectively in the society in which they live in.

1.2 Statement of the Problem

Despite the clamor for self-reliance and job creation in Zimbabwe, the relevance of mathematics education in the development of life skills in secondary schools has not given enough attention to quality, relevance, and functionality of education (Esangbedo 2014). This is evident in secondary schools' students that have graduated for both O level and A level that are not yet self-reliant and cannot even do anything for themselves (Double Gist, 2017). Secondly, although it is basic science education that prepares the students for post-basic and tertiary education, the planning of education for job creation has been shifted to the last two levels of education (the post-basic and tertiary levels) (Double Gist, 2017). Consequently, the need to investigate the innovative and life skills integrated into basic science education and see how the skills are being imparted to the students for job creation. (Tooley & Bornfreund, 2014)

In the last two decades, one of the problems facing Zimbabwe and many other developing nations has been that of unemployment (Munangagwa, Chidochashe L. 2019). Majority of College leavers and university graduates are jobless. This perhaps may be because of over dependence on government jobs or white-collar jobs. In the country today, graduates cannot create jobs; they strive to be employees of labor rather than being employers in their various fields. The problem keeps crying for solutions and government feels that something must be done to get out of the waterloo. Students in secondary schools have no substantial conviction of the relevance of mathematics education in the development of life skills as many researchers only researched on life skills without inculcating the relevance of mathematics to it which of course will serve as a great foundation to self-reliance of the youths in the society.

1.3 Significance of the Study

Mathematics is more than just the science of numbers taught by teachers in schools and either enjoyed or feared by many students. It plays a significant role in the lives of individuals towards the development of any society. This study is necessary because we rely on mathematics to solve our daily problems. Also, mathematics is crucial for many careers and job opportunities in today's increasing technological society.

The importance of this study will give a clear insight into the relevance of mathematics education to individuals, artisans, traders, school subjects; economic activities, politics development, business advancement, technological knowhow, cannot be over-emphasized. Zimbabwe, like every other nation in the world, depends upon mathematics as one of the most important subjects that could help the nation meet her objectives for science and technological development.

The study will expose individuals and the society at large that Mathematics learning provides opportunity to accept what can stand the test of reasoning and what is true and acceptable in real life situation which could make young people to succeed in life. This is so because, teaching of mathematics entails accuracy and systematic arrangements of results which are tools necessary to excel in life skills activities.

More so, the findings of this study will help in shaping the mentality of Zimbabwean youths who have their eyes on white collar jobs and expecting government to provide job opportunities for them, this study will inculcate the spirit of self-reliance and self-independence in them.

Finally, the study will be in the archive of knowledge and also serve as research tool to researchers who seek for further study on the topic.

1.4 Aim

The aim of the study is the relevance of mathematics education in the development of life skills among secondary school students.

1.5 Objectives

1. To determine the life skills that can be gained by learners in secondary schools through mathematics education.
2. To examine the effect of mathematics education on the development of life skills.
3. To examine factors that pose challenges for the acquisition of life skills.
4. To proffer solution to the challenges of acquisition of life skills

1.6 Research Questions

1. What life skills can be gained through mathematics education among learners in secondary school?
2. What is the effect of mathematics education on the development of life skills in secondary school?
3. What are the factors that pose challenges for the acquisition of life skills in secondary school?
4. What are the solutions to the challenges of acquisition of life skills in secondary school?

1.7 Research Methodology.

Overview

This study was conducted in three phases. Phase one was an exploratory phase to quantify the extent to which textbooks demonstrate the relevance and utility of mathematics across a range of careers. Phase two was a follow-on investigation to explore the extent to which teachers educate their students on the relevance and utility of mathematics and the resources they use in this effort, in the absence of supportive textbooks. Phase three was done via semi-structured interview on students.

1.8 Delimitation of the Study

The study was carried out in Warren Park district in Harare Province of Zimbabwe. The district has been preferred in this study because the education district comprises of different types of school categories such as high-density government schools, high density private schools and boarding schools. Questionnaires and interviews were used as the primary data collection instruments for the research. The research was carried over a period of four months.

1.9 Limitation of the Study

1. Financial constraint- Insufficient fund tends to impede the efficiency of the researcher in sourcing for the relevant materials, literature or information and in the process of data collection (internet, questionnaire and interview).
2. Time constraint- The researcher will simultaneously engage in this study with other academic work. This consequently will cut down on the time devoted for the research work.

1.10 Conclusion

The researcher has focused on the background of the study which made the researcher to investigate the relevance of mathematics in the development of life skills among secondary

students. The researcher also discussed Aims and objectives that he assumes will help him in researching this project. The significance of the study hopes to give a clear insight into the relevance of mathematics education to individuals, artisans, traders, school subjects; economic activities. Limitations and delimitations were also discussed in this research.

CHAPTER TWO: LITERATURE REVIEW

INTRODUCTION

The chapter intends to review the literature on the use of Mathematics in teaching life skills. Franker (2023) defines literature review as a way of finding out what books, journals, articles, government reports, publications, and other documents revealed about the subject. Literature review is important in identifying the literature to which the research will make a contribution and contextualizing the research within the literature. This chapter will review related literature focusing on identification of related literature, critical interpretation and evaluation of studies done by other scholars that are related to the study. This will be done in conjunction with the research questions.

2.1. Life skills that can be gained through Mathematics education among learners

Mathematical Applications

Hannula (2020) asserts that the reality is that we employ mathematics on a regular basis. In our daily lives, mathematics is quite useful and thus, It is important to keep track of how one encounters mathematical applications in everyday life, from the time one wakes up until bedtime. Every day, we use math ideas and abilities learned via problem solving. When we first wake up, we check the time to determine whether we have enough time to attend to numerous tasks. When we brush our teeth, we think about how long the brush will last, how much it will cost, how much paste will cost, and how many new ones are available. Water consumption, availability, conservation, and effective waste water management are all important considerations in this regard.

Drinking coffee, tea, or milk the amount, the temperature balance that does not affect the tongue, the quantity consumable, the proportion of mixes that make up milk, coffee powder or decoction, the

boiling stage, the filtering mechanism, and washed cups / glasses that ensure health all necessitate analysis, reasoning, and focus. Hannula (2020) asserts that in this regard, acquisition of raw materials for food preparation requires mention, which requires calculation, commercial mathematics to learn how a dealer measures, calculates, and delivers change! Hence, we can use mathematics to decipher patterns, identify relationships, and forecast the future. It assists us in a variety of vital tasks in our everyday lives as mentioned above.

The following are applications of mathematics in life :

Banking and Financial Services

The most essential aspect of banking and finance is mathematics. To be able to keep the money in the best possible condition, it is important to keep the accounts correct. Math aids in the calculation of bills, financial responsibilities such as taxes, insurance, and loans, among other things.

Architecture

Mathematics is a fundamental component of all engineering fields and is frequently employed in architecture (Vijayan & Joshith 2018). Architects utilise mathematics to determine the square area of rooms and structures, as well as the measurements of the ground area and other areas such as parking, plumbing, and others.

Interior Designing

Most individuals are unaware that this field requires a significant amount of arithmetic. Not only must finances be established, but interior design must be designed depending on the space and volume of the specific rooms. Different mathematical ideas are required to compute the layout.

Sports

Mathematical principles can assist people in making more rational judgments. When participating in team sports, everyone must be able to make the best judgments for the team. Learning math teaches people how to make analytical judgments based on reasoning. As a result, math is essential when participating in sports.

Computer Science

Mathematics aids in the learning of data input in many roles that rely solely on mathematics (such as engineering, science, computer programming, accounting, and banking). In computers, mathematics is a key intellectual tool.

Cooking

Mathematics is also important in the kitchen. Baking and cooking need certain mathematics abilities. Every component must be measured, and we must occasionally multiply or divide to acquire the precise amount we require. Everything we do in the kitchen necessitates the use of mathematics. Even utilising a fireplace necessitates basic math abilities.

Music and Dance

There is always math involved in music, whether you write it, listen to it, or study a dance routine. Every song has a distinct pulse. And every dance has its own beat. As a result, arithmetic is extremely crucial in both music and dancing.

Fashion Designing

Mathematics is used to measure sample cloth for fittings and to maintain consistency in sizing. Fashion designers utilise math in perimeter measures, waist diameter, and mathematical methods to assist construct designs, determine the amount and cost of fabric needed to carry out the project.

Gardening

When trying something new in the garden, essence calculations and measurement abilities are always required. The gardening process requires measuring the garden space and determining how much the trees produce to feed others, as well as calculating the cost of the plantings and the cost of selling them.

2.2 Effect of Mathematics education on the development of life skills

Mathematics is often viewed as an abstract and theoretical subject. However, it is a discipline that is utilized in various applications in everyday life. Mathematics enables people to analyze, organize, and observe the different activities that are encountered daily. It is considered as a human creation and provides conceptual tools needed to model, investigate, and understand both the natural and constructed worlds. A mathematical context refers to the familiar situation in which certain mathematical procedures are applicable, and mathematical literacy is citizens' ability to understand and deal with the role that mathematics plays in the world. Mathematics is deeply involved in people's daily activities. It is necessary for life. It exists and is applied everywhere by people in every modern society. The day-to-day tasks of people in their personal lives and in their work environment cannot be accomplished without using mathematics. Thus, it appreciates the fact that mathematics is there in everyday life. (Su, 2020)

The notion that mathematics is found in daily life is important because when one states that mathematics is in daily life, it emphasizes that the mathematics discussed is not just confined to the classroom or school mathematics. Math is utilized as a way of thinking critically or problem-solving in analyzing situations. It controls life and is either used or manipulated. Certain guidelines and remarks are part of the understanding of everyday life mathematics. Everyday life mathematics entails official mathematics in terms of institutionalized mathematics, all formal mathematics, semi-formal mathematics that is taught in schools, and informal mathematics that emerges in home, community, and occupational settings. Learning

mathematics is a lifelong process and employs a new beginning at any moment of life. It is necessary for survival and makes a person astute, sharp, informative, smart, and cunning. Mathematics is for human beings and human beings have always known how to use it in their affairs. Aborigines or primitive societies have their own mathematics that suffices for meeting their needs. Mathematics is a universal faculty, a fundamental cognitive capacity to see patterns or relationships in experience. Likewise, numbers are a universal faculty and language common to all cultures. (Ahdhianto 2020)

Mathematics and Problem-Solving Skills

The problem-solving process in mathematics whether it is working through algebraic equations or applying geometric principles provides individuals with strategies that are directly applicable to real-world problems. The ability to identify a problem, analyze it, explore possible solutions, and implement an effective strategy is central to navigating daily challenges. Mathematics fosters perseverance, as students often encounter problems that initially seem insurmountable. However, the iterative process of trial and error, coupled with critical analysis, eventually leads to solutions. This “growth mindset,” where failure is seen as a step towards success, becomes invaluable when dealing with personal, academic, or professional difficulties. Whether managing finances, optimizing time, or troubleshooting technical issues, mathematical problem-solving strategies offer individuals a reliable framework for overcoming challenges.

Decision-Making and Mathematics

Effective decision-making requires the ability to weigh options, assess probabilities, and anticipate outcomes. Mathematics provides the tools to approach decisions logically and quantitatively. For instance, financial literacy such as understanding interest rates, budgeting, or investing relies heavily on mathematical principles. Without a solid grasp of basic

mathematics, individuals may struggle to make informed financial decisions, leading to inefficient resource management or even financial hardship.

Moreover, statistical reasoning aids in making decisions under uncertainty. In fields ranging from healthcare to business, understanding data, evaluating risks, and drawing conclusions from numbers are all essential to making choices that are both rational and informed. Therefore, mathematical education not only contributes to personal financial health but also empowers individuals to make data-driven decisions in various aspects of life.

Time Management and Organization

Mathematics is inherently structured and sequential, teaching individuals the value of organization and time management. Scheduling, prioritizing tasks, and adhering to deadlines require the same systematic thinking that is used in solving mathematical problems. For example, when working on a complex project, breaking it down into smaller, more manageable parts is akin to solving a long equation step-by-step.

Moreover, the concept of efficiency finding the quickest and most effective way to solve a problem is central to both mathematics and time management. By learning how to organize tasks, allocate resources effectively, and meet deadlines, individuals develop essential organizational skills that translate well to both professional and personal spheres.

Mathematics and Adaptability

In an ever-changing world, the ability to adapt and learn new skills is paramount. Mathematics instills a mindset of flexibility and adaptability. Problem-solving in mathematics often requires shifting approaches when one method does not yield results, encouraging individuals to be

open to new perspectives and solutions. This adaptability extends to real-world scenarios, where new information or changing circumstances may require rethinking previous strategies.

Moreover, the abstract nature of higher mathematics such as calculus or algebra—trains individuals to approach complex, unfamiliar situations with patience and persistence. These qualities are crucial in navigating the uncertainty and challenges inherent in life, both professionally and personally.

The Role of Mathematics in Professional Development

Mathematics plays a pivotal role in many careers, particularly in fields like engineering, economics, technology, and finance. However, even for individuals in non-mathematical professions, the logical and analytical skills acquired through mathematics are highly transferable. Problem-solving, decision-making, and the ability to think systematically are essential in virtually every career path.

For example, in business, mathematics is integral to data analysis, market research, and strategic planning. In healthcare, mathematical modeling and statistical analysis are used to make critical decisions regarding patient care and resource allocation. Thus, the skills developed through mathematical study not only enhance individual career prospects but also contribute to the broader workforce's ability to innovate, solve problems, and make informed decisions.

2.3 Challenges of the acquisition of life skills through Mathematics

Mathematics is a fundamental subject that underpins many aspects of our daily lives and various fields of study. Despite its importance, many students encounter significant obstacles in mastering mathematical concepts. These challenges can impede their overall academic

performance and reduce their confidence in tackling math-related problems. Here are some key challenges faced in learning mathematics:

Abstract Nature of Mathematics

One of the primary challenges in learning mathematics is its abstract nature. Unlike subjects that are more tangible and directly relatable to everyday experiences, mathematics often involves concepts that are not immediately apparent. This abstraction can make it difficult for students to grasp and retain mathematical ideas, leading to frustration and disengagement.

Maths Anxiety and Fear

Math anxiety is a widespread issue that affects students at all levels. It can manifest as feelings of tension, apprehension, and fear when dealing with mathematical tasks. This anxiety can hinder students' ability to perform well in math, as it impacts their concentration and confidence. Over time, the fear of math can become a self-fulfilling prophecy, where students' negative attitudes towards math lead to poorer performance and further reinforce their anxiety.

Lack of Real-World Relevance

Students often struggle to see the relevance of mathematics in their everyday lives. When math is taught in isolation, without connecting it to practical applications, students may find it difficult to understand why it is important. This lack of relevance can result in decreased motivation and engagement in learning math.

Ineffective Teaching Methods

The methods used to teach mathematics can significantly impact students' learning experiences. Traditional approaches that rely heavily on rote memorization and repetitive exercises may not

be effective for all learners. Innovative and interactive teaching strategies that cater to different learning styles are essential for making math more accessible and engaging.

Resource Limitations

In many educational settings, there is a lack of resources to support effective math instruction. This can include outdated textbooks, insufficient access to technology, and limited professional development opportunities for teachers. Resource limitations can hinder the implementation of innovative teaching methods and the provision of individualized support for students who struggle with math.

Socio-Cultural Factors

Cultural attitudes towards mathematics can influence students' perceptions and performance. In some cultures, math is viewed as a difficult subject that only a select few can master. These stereotypes can discourage students from putting in the effort to succeed in math. Additionally, gender stereotypes may impact girls' confidence and interest in pursuing mathematics.

Availability of teaching resources and methods of teaching mathematics

Adebjei and Owoeye (2020) found an important relationship between the use of recommended textbooks and academic performance. According to Douglas and Krishin (2020) in a broad review of activity based learning in maths in kindergarten through grade eight concluded that using calculating materials produces greater achievement than not using them. They also noted that the long term use of concert instructional materials by teacher's knowledgeable in their use improves student's achievement and attitudes. Ankomoh (2018) noted that effective teaching and learning greatly lived on the competences of its human resources as well as material resources which are needed for the integration of knowledge. According to Psacharopolous and Wood Hall (2021) test books are a major input in

performance in examinations. This view is shared by Chepching (2021) who observed that availability of quality text books in secondary schools is strongly related to achievement among children from lower income families especially in public schools. According to Munda et al (2019) physical facilities contribute positively to students' academic performance.

The teaching methods used to impart knowledge are very important in motivating students understanding of mathematical contents. Discussion, project and discovery methods create an enabling environment for the learners and ensure that the individual differences are taken care of. These methods are child centred. According to Costello (2022) lecture method is ineffective in that it turns the learners into passive participants in the learning process. However, despite the disadvantage, lecture method is useful in covering large content (SMASSE, 2020). Teaching and learning materials for mathematics questions on uses of text books, geometrical sets calculators coloured chalks, charts and models enhances learning. Lack of use of these teaching aids demotivates the students.

Another research finding suggested that students often have very different perception of how a mathematics class should be conducted (Diamond, 2022). Teachers often followed a text book to fill the allotted time for mathematical computations via pencil and paper practice alone. This practice tends to leave little opportunity for creative problem solving and mathematical interpretation. The mathematics taught in many schools therefore appeared to student as only a creation of teacher 's and text book writers as opposed to essential life skills (Diamond, 2022). Unfortunately, students who objected to the format or a goal of a mathematics class could either argue convincingly for different approach or simply trust the teacher and wait for results (Diamond 2022). Without doubt the teacher maintained a potent force in the classroom. From research it was also found that a teacher 's enthusiasm towards the subject matter had a greater impact on the student's attitude than instructional variables. A teacher who showed excitement towards mathematics for example tends to produce similar

enthusiasm to their student. Furthermore, a teacher who disliked and feared mathematics also passed on a lasting negative attitude to students (Burton, 2019).

School Environment

The school that one attends is the institutional environment that sets the parameters of a student learning experience. Students' academic success is influenced greatly by the type of school they attend. School factors include the structure, school composition and school climate. Schools are accountable for student's performance. Depending on the school environment schools can either open or close the doors that lead to academic performance Barrg (2021). According to Crosnoe et al. (2021) the school sector (public or private) and class size are two important structural components of the school. Private schools tend to have both better funding and smaller sizes of class than public schools. Overcrowded classrooms make it virtually impossible to carry out the kind of individualised and performance-oriented instruction essential to meet the standards. In many schools' teachers are typically assigned to classrooms with forty-five and above learners.

However this affects teacher's potential negatively in the sense that they will not be able to attend pupil's weaknesses one by one. In such settings chances for meaningful instruction between teacher and student are slim and opportunities for good teaching and learning are severely compromised Crosnoe et al (2021).

According to Eamon (2021) the additional funding for private schools leads to better academic performance and more access to resources such as computers which have been shown to enhance academic achievements. Libraries are important in the academic performance of learners in schools. Williams et al (2022) explain that libraries play a crucial role in providing enrichment to students from disadvantaged backgrounds by providing

additional help to develop skills to succeed. However, some schools do not have libraries and if the libraries are there, there are limited resources. With this, learners are left with no option rather than depend on restricted textbooks as well as their teachers who sometimes do not use teaching methods that are palatable to students which eventually stimulate negative attitudes toward mathematics. With the acute shortage of qualified mathematics teachers most of the students are taught by unqualified teachers resulting in poor performance. According to Balli and Alvarez (2022) students who attend schools with higher number of teachers with full credential tend to perform better and vice-versa. Sugahara (2018) postulates that learner's backgrounds relating to the availability of educational resource at home such as books, electronic resources such as computers, calculators study desks and chairs as well as a conducive study environment and general academic support from home are important when it comes to pupil's success academic wise. Students who have access to such resources are at an advantage compared to those from poor families for the reason that they will be more informed about the most update developments around them thus supplement their learning at school.

Students from diverse backgrounds may face additional barriers in learning mathematics. Language differences, economic disparities, and lack of support at home can all contribute to difficulties in math achievement. Addressing these inequities is crucial for ensuring that all students have the opportunity to succeed in mathematics.

Teacher's attitudes towards mathematics

Teachers also need to give positive messages to students at all times. The environment created by teachers at early stages of secondary education is very important. Students are moving

from primary school where they were being taught by one teacher in all subjects but as they get to form one there is a change. The teacher has to lay a good foundation so as to create a strong base for the subject. In their research Beilock et al (2018) found out that the level of anxiety held by woman elementary teachers also predicted the achievement of the girls in their classes but not boys. They further illustrated that girls look up to their female teachers and identify with them at the same time teachers are often and sadly carrying the idea that maths is hard for them or they are just not a math person . Many teachers try to be comforting and sympathetic about mathematics telling girls not to worry, that they can do well in other subjects, as a result a negative attitude is created among the students. Teachers and parents need to replace sympathetic messages such as, don't worry, math is not your thing with positive messages such as, —you can do this, I believe in you, math is an open beautiful subject that is all about effort and hard work, Boaler (2022)

Attitudes as a concept are concerned with individual's way of thinking, acting and behaving. Attitudes have very serious implications for learner, the teacher and immediate social group with which the individual learner relates and the entire school system. Attitudes are formed as a result of some learning experiences students go through. In this respect the learner draw from their teacher's character to form their own attitudes, which may affect their learning outcomes Yara, (2018). According to Yara, (2018) teachers with positive attitudes towards mathematics were motivated to inspire favourable attitudes in their students and vice versa. This immediately puts the teacher in spot light as one whose attitude, expressed in their behaviour has a telling effect on students. Teachers' attitude towards mathematics has a major role in shaping classroom practices Bolhuis & Voeten (2021). People also learn attitudes through observation of people around them, especially if they are people they admire, respect

or hold in high esteem. Children therefore invariably observe the attitudes of parents and teachers and learn a lot from them. Teachers are regularly role models whose behaviours are easily copied by students.

Motivation of teachers

A highly motivated teacher puts in the maximised effort in their job. According to Larrant (2018, p69), —today relationship between teachers and pupils is often up-side down, pupils go to school because they must and teachers teach because they are paid to. Teachers mourn that their profession is not respected and complain that they are inadequately paid for their duties they are required to do. They look over their shoulders at other professions and condition of service for a better life, this assertion by Farrant (2018) exhibited lack of motivation on the part of both teachers and students. More so it may contribute to ineffectiveness and inefficiency in academic work and its effects are poor performance. Studies by Lockleed (2022) cited in Etsey (2021) revealed that lack of motivation and professional commitment produce poor attendance and unprofessional attributes towards students which in turn affect their performance academically.

Bandura (2022) in Olegede (2023) through his theory of social learning implies that the teacher should demonstrate their own enthusiasm in mathematics learning so as to model a desirable behaviour to students, if the teacher looks bored according to this theory so will the students. This means that the teacher has a big responsibility as the imitation that can go beyond the classroom to the students own career. Hence it is important to use positive verbal remarks in the classroom as well as varying approaches in solving problems. However this can only be possible if the teacher has a psychological background in his teaching qualifications which would equip them with the correct methods of teaching. Only a few people go for a degree in mathematics and those only do the service for a short time and go

for greener pastures. As result there is an acute shortage of mathematics qualified teachers. In Zimbabwe a number of mathematics graduates join the teaching service just for a short period, and then look for greener pastures.

Students are left without qualified teachers resulting in poor performance at O' Level. A 'level students are employed to teach maths to alleviate the shortage. Those mathematics teachers who are available are overloaded with work resulting in low morale as some of them are given exam classes. These teachers work extremely hard to see students through and non-examination classes are given to unqualified teachers. However, there was an observation made by the findings by the Ministry of Education through the curriculum development unit (1993) who discovered that most teachers had ordinary level as their highest academic qualification and a certificate in education as their highest professional qualification, teachers need to upgrade themselves.

Besides lack of motivation through pay, one finding was that the teachers never learned the subject properly all the way from kindergarten through college Sweeney (2018). Teachers performed badly due to lack of innovation. The teacher centred methods are used instead of child centred methods. The only methods used are exposition and lecture methods resulting in students knowing the procedure and that demotivates them. This is because such teachers lack theoretical background that can assist them in motivating, reinforcing and giving feedback to students among other factors that would enhance their positive self-esteem. According to Galabawa, (2022) the teacher is the heart of classroom instruction and their effectiveness depends on their competence that is academically and pedagogically. In addition, the teacher needs efficiency which can be seen through their ability to tackle different mathematical concepts with confidence, handle his work load without succumbing to pressure and commitment to duty. However, this can only be possible if the teacher has support in terms of teaching and learning resources from education managers and supervisors.

Mosha, (2021) has observed that mathematics is a skill that is difficult to acquire and because the teaching profession does not pay well, there is a shortage of qualified mathematics teachers in the subject. As a result, some personal and environmental factors can influence causal beliefs which in turn influence related behaviours. For a teacher to understand the attribution theory and be able to use it to change negative mathematical attitudes of students and they own, must possess a professional qualification in the teaching of mathematics and be in possession of knowledge in education psychology which is the foundation needed for one to be an effective teacher in the subject.

Teacher's qualifications and teaching of Mathematics.

Mathematics is an art which needs to be learnt in order to be understood hence it needs to be taught by a teacher with a sound knowledge of the subject matter. Chivore (2020) concurs by saying that teaching is about how to put across what one knows to the learner. Consequently, if a teacher lacks content knowledge he cannot teach effectively resulting in poor performance among learners. The assumption here is if a student comes from a sound mathematical background and is not dull then a teacher should examine the school for the source of the student 's negative view of one's poor performance. Failure has also been attributed to the society, such as the instability of educational policies, under-funding of the educational sector since these views are either internal or external the consequence is that the learner can control some causes while others are beyond their control. This hinges on the study because perceptions from an individual's belief system, which will in turn guide their level of commitment in mathematics Salami, (2020).

Students attitude towards Mathematics

According to Cohen, (2022) the learning of mathematics is affected by the self-reliance of learners in their mathematical abilities and the attitudes, beliefs and feelings they harbour towards mathematics. Kondo, (2021) noted that children begin schooling with rather positive attitudes however these become less positive as children grow up and they frequently become negative at high school. Hoyles (2020) found that 14-year-old students tend to associate their

mathematics experience with feeling of anxiety and failure. When a student has repeated failures in maths it could be in class exercise or test a student might feel that maths is difficult hence, they cannot do it. A negative attitude develops and they concentrate on other subjects. Frank and Lester (2020) said the negative attitudes and the dislikes of learning mathematics as being caused by a confusion of what and when to do with formulae so as to understand and how to write down the answers. They also highlighted three causes of negative attitudes as

1. Students find themselves in the problem for when to and which formula to apply for a correct answer to be attained.
2. If students score low marks two consecutive times their moral reduces.
3. Scared students have either low or no interests in mathematics.

Twoli (2023) ascertains that repeated low achievements in mathematics examinations may lead to unfavourable attitude towards mathematics learning. Mathematics can be taken to be a hub and other subjects are spokes. Pupils should be able to recognise the use of mathematics

in other subjects. Taking for instance food and nutrition the proportions that they measure when cooking, in accounts and business studies their calculations in loss and profits, these are only but a few examples in the use of everyday mathematics in our daily lives. Most students fail to link mathematics with other subjects; hence they fail to appreciate its richness and value. Students also develop a negative attitude towards mathematics due to language that is used, the symbols, notations and formulae. Most students fail to understand which formulae to use to get to the correct answer. If pupils have a less understanding of the language in mathematics, they tend to view it as a very difficult subject to handle. Preparing students for ordinary level exams is important but unless students understand how to apply mathematics skills they will not always be able to use these skills, in their future lives. O Leary (2019) also viewed mathematics as a subject that is lacking any kind of inspiration or sense of personal suggestion about the future. Apart from this they believe that mathematics is abstract it does not require clear thinking. Borasi (2019), Shoenfield (2021) state that the concepts students hold about maths determine how they approach the subject. In many cases they approach maths as procedural rule oriented. This prevents them from experiencing the richness of maths and many approaches that can be used to develop a positive attitude towards the subject.

2.4 RESEARCH GAPS

According to the literature reviewed, it is evident that all over the world using Mathematics to acquire life skills is being embraced. The developed nations are way ahead in implementing this. However, it has been noted that despite most nations' commitment to using Mathematics to develop life skills, some schools are prepared while others are yet to be prepared.

Zimbabwe, like many other nations has schools which are using mathematics to teach life skills.

This study focused on the relevance of Mathematics education in development of life skills in Warren Park district in Harare Province of Zimbabwe no known study has been conducted to establish this.

2.4 SUMMARY

This chapter was committed to exploring relevant studies to inform this research project. It adopted the concept of investigating the known in order to access the unknown information. This chapter took a consultative approach in order to draw from the expertise of the past and recent researchers by looking at their findings that are relevant to the relevance of Mathematics education in development of life skills in the education sector. This review was intended to develop an informed background which forms a strong foundation on which the researcher will build up strategies to extract essential research information for the current study that is focused on finding out about the relevance of Mathematics education in development of life skills. The next chapter will look at the research methodology.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 INTRODUCTION

In the previous chapter, the researcher provided a literature review of the subject under discussion. In this chapter, the researcher examines a detailed description of the research design and methods that were employed to ensure the trustworthiness and authenticity of this study. The way research is conducted must be viewed in terms of both the research design and methods employed to both meet its objectives and answer the research questions as highlighted in the first chapter (Vogyt, Garder, & Haeffele, 2019). The current chapter provides the researcher with a systematic means of solving the current problem and describes how the required data will be collected. In this chapter, the researcher describes the research paradigm, approach, design and process. The researcher also discusses the data collection methods and data analysis techniques that will be used to gather and analyse the data required.

3.1 RESEARCH PARADIGM

Interpretive research generates data through observation, talk and/or document selection and analyses them through different methods such as discourse analysis, story-telling analysis, metaphor analysis and many others (Leavy, 2017). Ultimately, this study will base upon an interpretive research paradigm because the investigator is trying to see the social world from the participants' respective and to consider their perceptions of the world (Rahman, 2020). Correspondingly, Pham (2018) states that with interpretivist outlook, researchers tend to gain a profound understanding of the phenomenon and its complexity in its distinctive context instead of trying to generalise the base of the understanding for the whole population. An interpretive approach bank on both the participant's viewpoint and researcher's understanding of the truth (Marsden & Littler, 2020), so that the researcher can discover the significance and

importance of the action or to make it understandable and clear to others. People ascribe meaning to the world around them, and to understand that meaning the researcher has to approach them while interpreting their assigned meaning (Rahman, 2020). Alase (2017) emphasises that since many interpretations is established among persons' rapport, interpretivist researchers should try to understand the varied ways of seeing and experiencing the world through different circumstances and cultures and try to evade the bias in studying the occasions and people with their own understandings.

The main advantage of this using this paradigm is that, with the varying views to look into phenomena, interpretivist researchers can not only describe objects, people or events, but also intensely understand them in social setting. Moreover, the researchers also can carry out these types of study in natural setting through utilising fundamental methodologies as grounded theory, ethnography or case study to gain the insider's understandings of investigation's objects (Pham, 2018) to provide with more genuine information related to the object of study. Just like any other research paradigms, the interpretive research has some limitations. One of these limitations is that the interpretivist aims to gain the profounder understanding and facts of phenomena within complexity of the context rather than generalise these outcomes to other context and other people (McGrath, Palmgren, & Liljedah, 2019), hence it has a habit of leaving out a gap in authenticating validity and practicality of investigation results with using scientific techniques. Another criticism of interpretivism is that of its ontology view inclines to be subjective rather than objective (Alase, 2017). However, despite these limitations, the paradigm has its distinctive role contributing to provide the researcher with a holistic framework and manifold view to address fundamental social issues, precisely in educational contexts.

3.2 RESEARCH APPROACH

A research approach is a research model to conducting a research that has been verified by the research community for long and that has been in practice for hundreds of years (Tech, 2018). It is a guideline for developing research methodology and for conducting a research in the most valid and appropriate manner. The qualitative study is especially responsive to research questions of why, how and what and it offers scholars a flexible yet integrated framework for holistic examination of phenomenon in its natural state (Bright, 2021). It enables the study to obtain and assess opinions, attitudes and perceptions of teachers, heads of schools, learners and other stakeholders that are involved in the teaching fraternity.

According to Christopher (2022), a qualitative study can be used to assess personality variables such as attitudes and opinions about events, individuals or procedures. This process of research involves emerging questions and procedures that look at data typically collected in the participant's setting as well as employing data analysis inductively building from particulars to general themes and the researcher making interpretations of the meaning of the data (Cresswell, 2019).

The qualitative research is ideal as it deals with perceptions where rich descriptions of perceptions, feelings, and opinions are preferred to better understand the actions of all educational stakeholders under review. Saunders (2021), concurs that a qualitative approach provides rich, in-depth insights into a phenomenon through descriptions. Trigueros (2017) alerts that qualitative research covers a smaller geographical area but goes into depth with a view of understanding a phenomenon under research. In that regard, a deeper understanding

why the gap exists between the policy direction and the implementation on the ground will be achieved.

Advantages of Qualitative Research

Qualitative research provides a much more flexible approach to conducting research and it produces a detailed description of participants' feelings, opinions, and experiences; and interprets the meanings of their actions (Eyisi, 2016). A qualitative approach is exploratory and seeks answers to higher-order questions relating to how and why a particular phenomenon, or behaviour, operates as it does in a particular context (Rahman, 2017). Qualitative research can capture changing attitudes within a target group. The qualitative research approach allows the researcher to ask questions that cannot be easily put into numbers to understand human experience. Getting at the everyday realities of some social phenomenon and studying important questions as they are practised helps extend knowledge and understanding.

A qualitative research approach is regarded as being ideographic (Rahman, 2017). The approach enables the researcher to understand different people's voices, meanings and events in a study. Qualitative research, therefore, allows for a holistic approach to understanding the human experience in specific settings.

Qualitative research provides a much more flexible approach as the design can be constructed and reconstructed to a greater extent (Eyisi, 2016). If useful insights are not being captured researchers can quickly adapt questions, change the setting or any other variable to improve responses. An appropriate analysis of an issue can be produced by utilizing qualitative research methods, and therefore the participants have sufficient freedom to determine what is consistent for them. As a result, the complex issues can be understood easily. Thus, qualitative research can contribute to the understanding of the complex issues regarding disciplinary issues in primary school.

Qualitative data capture allows researchers to be far more speculative about what areas they choose to investigate and how to do so. It allows data capture to be prompted by a researcher's instincts for where good information will be found (Rahman, 2017). If useful insights are not captured or the responses do not fit the researcher's expectation, the researchers can quickly adapt questions, change the setting or any other variable to improve responses. Qualitative approaches to research, therefore, are not bound by the limitations of quantitative methods.

3.3 RESEARCH DESIGN

Data is collected and analysed in research using various methods. This is called research design. A research design is an arrangement of conditions for collection and analysis of data in a manner that aims to combine both relevance to the research purpose with economy in procedure, Kothari (2019). According to Smith and Thorpe (1994) research design refers to the plan and structure of the investigation used to answer the research questions. In this regard the research design refers to the methods by which data is collected and analysed. The research design constitutes the blueprint for the collection, measurement and analysis of data. It also encompasses a careful planning of any scientific research from the first to the last step, Pandey, (2022). In this study, case study will be used

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 2016). Case study research involves the study of an issue explored through one or more cases within a bounded system that is a setting or a context (Creswell, 2019). A case study can be presented as a strategy of inquiry, a methodology or a comprehensive research strategy (Denzin and Lincoln, 2022; Yin, 2017). Case study research is a qualitative approach in which the investigator explores a bounded system (a case) or bounded systems

(cases) over time through detailed, in-depth data collection involving multiple sources of information for example observations and interviews and then reports a case description and case-based themes. Case studies are an important method in areas where innovations are studied, such as in the field of education. For the purpose of this study, a single case study is going to be conducted.

Thus, to do that it is obligatory on the researcher to decide why the case study method is the method most appropriate for the research in question as compared to the other possible research methods. It is also necessary that the researcher understand the strengths and weaknesses of the case study research method (Yin, 2019). There is no formula for choosing the case study to be the formal method of a particular research. However, for the purposes of this research, a case study is going to be applied because it possesses certain characteristics that make it the most appropriate research method for this particular research study. These characteristics distinguish the case study research from other types of research designs. These characteristics include the following: the focus is a contemporary phenomenon within a real-life context, the investigator has little control over events, and it is suitable for answering the “how” or “why” questions which may be posed. (Yin, 2019).

According to Yin, the three conditions that determine when each method is to be used are the type of research questions posed, the extent of control an investigator has over actual behavioural events and the degree of focus on contemporary as opposed to historical events.

3.3.1 STRENGTHS OF A CASE STUDY DESIGN

The main ideas of the Delphi strengths to be discussed in this section are from De Loe, 1995 and are supported by other authors including: De Meyrick, 2017; Forrest & Spolarich, 2019; Klenk & Hickey, 2021; Powell, 2017 and Yousuf, 2021. The strengths can be summarised as follows:

Anonymity: Anonymity of participants allows them to freely express their opinions without undue social pressure to conform from others in the group. Decisions are evaluated on their merit rather than who proposed the idea. The process also avoids negative group influences such as dominating members and political lobbying.

Effectiveness: Participants are given ample time to think about their responses to the questionnaires without any of the pressures associated with other data collection methods. Additionally, they have at least one and possibly more opportunities to rethink their ideas in the context of comments from other group members. The product of the survey can be a substantial number of ideas plus their evaluation.

Economy and Efficiency: The Delphi has been described as a cheap and relatively efficient way to combine the knowledge and abilities of a group of experts. This is because it allows a researcher to create an interaction within a diverse group of people using mailed questionnaires. Therefore, relative to other methods, which involve bringing people together, the Delphi is inexpensive.

Flexibility: The Delphi guidelines for the questionnaires design can be implemented in a wide variety of ways. Thus, the process provides individuals with a considerable degree of freedom in the expression of their opinions on the problem under investigation, often offering researchers new awareness of exploration.

3.3.2 Weaknesses of a case study design

Case study design is not immune to weakness. As much as the case study has shown that it has its own strengths, there are a number of weaknesses that are associated with it. However, this is not a reason to think that the case study is not appropriate for this study as all other methods

have their own shortcomings and weaknesses. The weaknesses associated with the case study can be summarised as follows:

Consumption of large blocks of time: Comparing it with other data collection methods such as telephone surveys and face-to-face interviews, the Delphi method is time consuming. This is due to its iterative and sequential nature that needs analysis and personalisation of questionnaires from the third round onwards. A single round can easily require three weeks and a three-round Delphi is at least a three- to four-month affair, including preparation and analysis time.

Researcher bias: If the first-round questionnaire is structured, it may impose the view of the researcher and his preconceptions about the problem on the participants by not letting them indicate the issues they believe to be of greatest importance on the topic. Thus the researcher may have an influence on the results. It has to be noted that the researcher has an important role of interpreting the qualitative comments made by the participants in Round One. This is done to ensure that all key issues are addressed in subsequent questionnaires. However, the potential of a researcher influencing the results, which could cause researcher bias, certainly exists.

Risk of moulding opinions: The iteration characteristics of a Delphi can potentially enable researchers to mould opinions, thereby influencing false consensus. Participants also have the potential to adjust their opinions to match those of other participants even though they may not be in total agreement with them. Also, the risk of not being able to distinguish expert opinion from non-expert opinion can result in bias.

POPULATION

Flick (2017) defines a population as an entire group of individuals with common characteristics that a researcher is interested in. Saldana (2021), describes a population as an aggregate or totality of all objects or subjects or members that conform to a set of specifications as defined by the researcher's interests.

Table 1.1 shows Population for the study

School	Number of teachers	Number of learners
A	21	156
B	14	142
C	18	83
Total	19	90

SAMPLE AND SAMPLING TECHNIQUES

3.4.1 Sample

Leedy and Omrod, (2022), define sampling as a process of selecting units from a population of interest so that by studying the sample generalization of results may take place. A selected sample should as much as possible be a reliable representative of the wider population in order to come up with authentic research study results. It is therefore a subset of the whole population which assists in coming up with a generalized conclusion. Robert (2017) preludes that sampling is a process of selecting units from a population of interest such that by studying

the sample generalization of results may take place. Chinyoka (2017) defines sampling as a proportion of the population selected from observation and analysis. Sampling is also regarded as a subset of the population under investigation Gay (2017). In general, a sample is simply a fraction of a population.

The sample for this study was drawn from the targeted population comprising Mathematics teachers and Mathematics learners. This implies that a sample is simply an extract from the targeted population. Purposeful sampling was used. According to Rahman (2017) in purposeful sampling the researcher identifies "information rich" participants for the reason that they are possibly knowledgeable about the phenomenon under investigation. Three schools were selected for the purpose of this study. Purposive sampling was used to select the administrators who participated. The most senior Mathematics teachers in the school were purposefully selected due to their experience in the subject area. In the learner category, Mathematics learners were selected due to their involvement in the subject. According to Creswell (2021), purposive sampling is used in order to access those elements in the sample that have in-depth knowledge about particular issues on their professional roles.

Sampling techniques

Purposive sampling was used in this study to select participants. The researcher ensured that the sample displayed all the characteristics of the population in order to make it a representative sample. Leedy (2023) states that the sample should be so carefully chosen such that through it the researcher will be able to see all the characteristics of the total population in the same relationships would be seen if the researcher was to inspect the total population. Purposive sampling is essential since it helps to identify primary participants. In this situation, it can be known as subjective or judgemental selective sampling. The researcher selected

experienced teachers who usually spend most of their time teaching and school heads who supervise schools.

Purposive sampling is a type of non-probability sampling that is mostly effective when one wants to study a cultural domain within, Robert (2017). He further stresses that purposive sampling is based on the researcher's judgement regarding the characteristics of a representative sample. In this study the researcher used knowledge and experience to select the members of the sample. A sample of 31 participants which included learners and teachers was drawn for purposive sampling. In this study the teachers and learners were purposively chosen. They were chosen since they were seen capable of providing the required information on Mathematics Education as well as challenges and opportunities. A sample of 20 learners and 11 teachers was used to answer interview questions respectively. Purposive sampling was used to select participants who were to display all the characteristics of the population.

3.6 DATA COLLECTION INSTRUMENTS

Data collection instruments, refers to the devices or tools used to collect data (Kabir, 2016).

In this light data collection instruments are tools used to collect information for research so as to get quality evidence that allows analysis that leads to the creation of convincing and credible answers to the questions posed.

Interviews

Chiromo (2019) sees an interview as a verbal representation of the set of questions that are set in advance. An interview can be exceptional tool that involve the collection of data through oral communication. There are two types of interview guides and these are structured and the unstructured questions. A structured interview guide is an interview which only allows questions on the list (Leedy: 2021). An unstructured interview guide is an interview which has room for adding more questions and responding to them (Leedy: 2021).

Advantages of interviews

The interviewer could probe for more information and opinions since the interview allows flexibility in terms of dialogue (Best and Khan: 1993). Maddon (2021) supported the use of interviews because they give instant feedback and they also allow the researcher to have a conversation with the participants as well as adding more questions. Interviews were also used to find clear explanations on what people think. Best and Khan (1993), say that interviews allow the interviewer to gain clear explanations about what the respondents think.

Interviews help the interviewer to obtain detailed information about personal feelings, perceptions and opinions of the respondent (Pyatt, 2016). This means that interviews help the interviewer to take all the information one needs immediately. Recording of respondents' own words is done to allow authenticity of the information given. Interviews achieve a high rate of response since they allow more detailed questions to be asked and questions and wording can be tailored to the respondent and the meaning of the questions clarified.

Disadvantages of interviews

However, the interview method has its limitations in that it can be time consuming in setting up and organising feedback. Information has to be analysed and interpreted before giving feedback. Interviews are expensive, if sample comes from a wider Geographical area. Bias may arise if interviewer influences responses of the respondent. Some respondents are unapproachable, rendering the data inadequate. If proper rapport is not initiated, it would be difficult to facilitate honest and frank responses. This can be countered by using observations.

DATA COLLECTION PROCEDURES

The researcher will seek permission to carry out the research from the Ministry of Primary and Secondary Education district office. Letters will be written to the three school heads seeking permission to do the research at the selected schools.

CREDIBILITY, TRUSTWORTHINESS AND TRANSFERABILITY

3.8.1 Credibility and Trustworthiness

According to Helen, (2022) triangulation involves the use of multiple and different methods, investigators, sources and theories to obtain reliable data. Triangulation helps the researcher to reduce bias and it cross- examines the integrity of participants' responses. There are three major triangulation techniques. The first is investigator triangulation that uses multiple researchers to investigate the same problem, which brings different perceptions of the inquiry and helps to strengthen the integrity of the findings.

The first method shall not be used in this study as only one researcher will participate. The second is data triangulation or informant triangulation that uses different sources of data or research instruments, such as interviews, focus group discussion or participant observation, or that utilises different informants to enhance the quality of the data from different sources. Source triangulation will be used for this research where four different schools will be used as data sources.

The third is methodological triangulation that uses different research methods (Denzin & Lincoln, 2022). Therefore, this study adopted source data triangulation in that different data sources were used to collect data from. Qualitative research data collection requires the researcher's self to immerse him or herself in the participants' world (Silverman, 2017). This helps the researcher to gain an insight into the context of the study, which minimises the distortions of information that might arise due to the presence of the researcher in the field.

The researcher's extended time in the field will help improve the trust of the respondents and provide a greater understanding of participants' culture and context.

Qualitative researchers consider dependability, credibility, transferability and conformability as trustworthiness criteria to ensure the rigour of qualitative findings (Helen, 2022). The credibility is involved in establishing that the results of the research are believable and can be trusted to provide real outcomes. Transferability refers to the degree to which the results of qualitative research can be transferred to other contexts with other respondents. It is the interpretive equivalent of generalisability. According to Schofield (2021), the researcher facilitates the transferability judgment by a potential user through 'thick description' and purposeful sampling. The researcher used semi-structured interviews to collect these rich descriptions from respondents by making follow up and probe questions. Relative prolonged engagement that allowed the researcher to get clarifications.

Ellet (2021) defines credibility as the confidence that can be placed in the truth of the research findings and these findings rely on the responses of the research participants. Credibility establishes whether or not the research findings represent plausible information drawn from the participants' original data and is a correct interpretation of the participants' original views (Swanborn, 2017). The study establishes rigour of the inquiry by adopting prolonged engagement with the respondents.

Credibility: This deals with the intended focus of the research and refers to confidence in how well the data and the analysis process is treated (Kornbluh, 2022). The researcher ensures that the findings are compatible with the perceptions of the participants (Gunawan, 2022). In this study, credibility was to be ensured during the course because techniques like triangulation of data gathering sources was used to ensure trustworthiness. The researcher make use of two methods of collecting data which include interviews and observations. According to (Williams

& Hill, 2019) triangulation strategy helps to compensate weaknesses of one method of technique of collecting data with an alternative strategy. Data were obtained from different experts in the education field, cross-checked and interpreted.

Confirmability: This aspect answers the question: Have the audience been told enough about the study to judge whether the findings do flow from the data and the experiences in the setting (Gunawan, 2022). This means that the research must be able to show how the researcher arrives at the constructs, themes and their interpretations (Kornbluh, 2022). Therefore, the details of the research, the background and the feelings of the researcher need to be made open for public scrutiny (Gunawan, 2022).

Transferability: This occurs when the findings of a study ‘fit’ into similar contexts outside the study. A study meets the criterion of transferability when its findings can fit into the contexts outside the study situation and when its audience views its findings as meaningful and applicable in terms of their own experience (Williams & Hill, 2019). The transferability for this study was ensured through the literature used to discuss the findings.

Dependability: In this aspect the researcher must employ techniques to show that, if the work were repeated, in the same context, with the same methods and with the same participants, similar results would be obtained (Gunawan, 2022). It also refers to the researcher’s need to account for the ever-changing context within which research occurs (Kornbluh, 2022). To ensure dependability in this research study the research processes were reported in detail, thereby enabling a future researcher to repeat the work, if not necessarily to gain the same results.

3.8.2 Data analysis

Qualitative data analysis refers to the range of processes and procedures that seek to change the qualitative data collected into some form of explanation, understanding or interpretation of people in a matter under study (Bright, 2021). In this study, data analysis seeks to provide information from collected data that addresses answers to the research questions. Schreier (2021) suggests that qualitative analysis involves a way of logically and systematically describing the meaning of data that is qualitative in nature. This data may be analysed by grouping it into parts or categories that are coded. In this regard, qualitative content analysis reduces the data in a more systematic manner. In this regard, the data will be gathered through the interviews and grouped into themes and sub content themes after which it will be analysed. Each theme will then be analysed for meaning to better understand the perceptions of Mathematical Education and Life skills.

3.9 Ethical considerations

Heilferty (2021) emphasises that ethical considerations arise at three stages of a research project, namely: when participants are recruited, during the intervention or measurement procedure to which they are subjected and in the release of the results.

Participants in this research comprised the school head, teachers and the learners. The researcher sought approval to conduct this research from the Ministry of Primary and Secondary Education. Participants selected for this study volunteered to participate and they were told that they will be free to withdraw at any time, if they wish to. Informed consent was requested from each and every participant with regards to their participation.

Confidentiality and anonymity

Confidentiality in research refers to control of access to collected information and the guarantee that the information will not be shared with unauthorised people (Peter, 2022). To cater for confidentiality the researchers should not identify participants or even to link them with what was said (Connelly L. M., 2021). In this study anonymity and confidentiality were assured to the participants as the school was given the name X school and the participants were also given codes such as Tr1 for teachers, St1 for students and H1 for school head teacher.

Protection from harm

Miller, Birch, Mauthner, & Jessop (2019) are of the view that, it is the duty of the researcher to make sure that the participants are not exposed to any danger and also assured them of danger free environment. Accordingly, the researcher guarantees the participants that their involvement in the study was not going to getting them in any danger or even trouble as he has already assessed everything and come up with measures to protect participants from any kind of danger.

The data was collected in a way that did not interfere with the normal activities of the participants. Moreover, the participants were assured of the confidentiality of the information they provided. Finally, the results of this research will be made available through Bindura University.

3.10 SUMMARY

This chapter explored the research design that guided this study. It further, discussed the research approach and process that was followed in gathering data. A qualitative research approach was used. The study employed a case study design. The data collection instruments as stated were interviews and observations. Issues of credibility, trustworthiness and transferability were also discussed. Finally, the chapter discussed ethical considerations. The next chapter will present data, analysis of the data and then discusses the findings of the research.

CHAPTER 4: DATA PRESENTATION, ANALYSIS AND DISCUSSION OF

FINDINGS

4.0 INTRODUCTION

This chapter focuses on data presentation. The presented data is then analysed. All the findings gathered will also be discussed at the end of the chapter.

4.1.0 DATA PRESENTATION AND ANALYSIS.

This research was aimed at answering four research questions which are written below.

1. What life skills can be gained through mathematics education among learners in secondary school?
2. What is the effect of mathematics education on the development of life skills in secondary school?
3. What are the factors that pose challenges for the acquisition of life skills in secondary school?
4. What are the solutions to the challenges of acquisition of life skills in secondary school?

4.2 Research Findings.

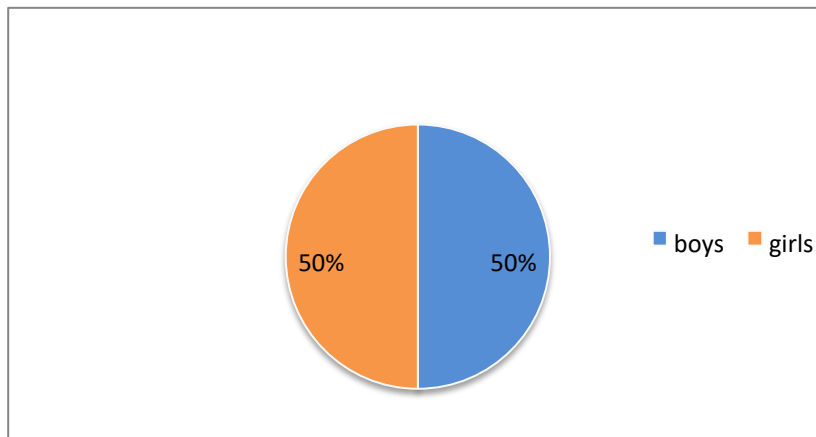
4.2.1 Demography

This section covers gender distribution of the respondents, that is learners and teachers

A sample of 20 learners

Fig 1

10 males and 10 females



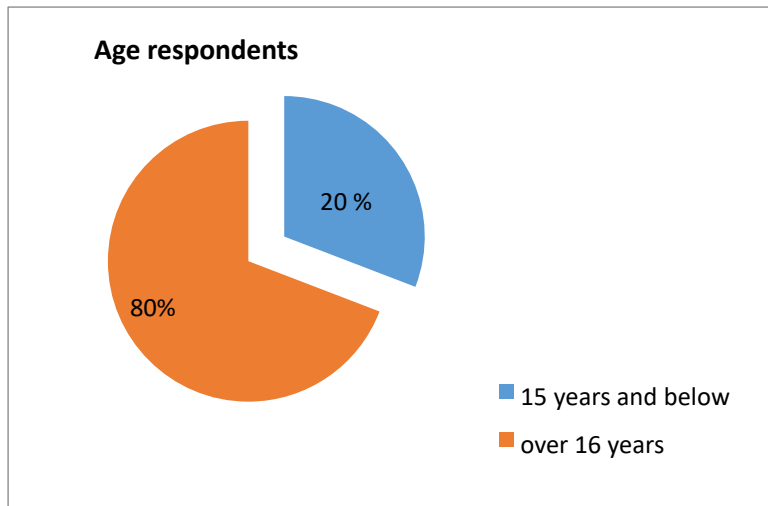
The pie chart above shows that there was gender balance with learners' respondents

Age of Respondents

Table 1

Age (Years)	Respondents
15 years and below	4
16 years and above	16

Fig 2

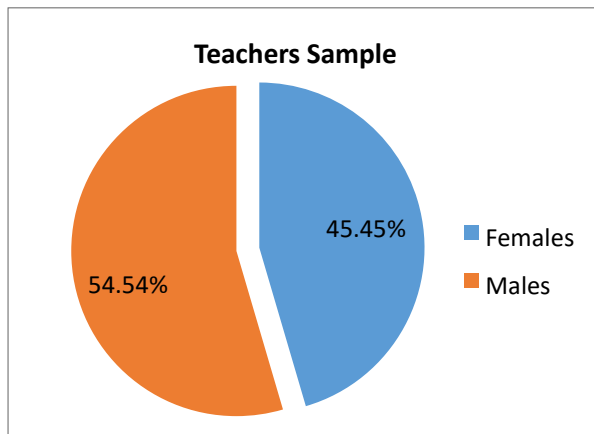


80 % were learners above 16 years and 20% were 15 years and below and these are candidates for O level

Fig 3

A sample of 11 teachers

6 males and 5 females



There more males that females in the research

Table 2

Qualification	Frequency	Percentage
CE	6	55
DE	5	45

Fifty five percent teachers are holders of certificate in education whilst forty five percent are diploma holders.

Table 3

The table below showing teaching experience

Teaching experience in years	Frequency	Percentage
1-10	1	9.09
11-15	5	45.45
Over 16	5	45.45

Ninety percent of the teachers have more than 10 years of teaching experience. However, if we compare with the teaching qualifications the teachers have the minimum qualification of CE and DE. This shows that teachers are not advancing themselves academically.

4.2.2 What life skills can be gained through mathematics education among learners in secondary school?

The research question was aimed at finding out the life skills that can be gained through mathematics education among learners.

Interviews

The interview question was: *How often do you apply mathematical concepts to solve real-life problems?* Regarding this question one the interviewee said:

L1: *"Mathematics is an integral part of my daily routine. I often use percentages and ratios to analyze discounts and compare prices while shopping, at our tuck-shop at home I apply basic arithmetic and statistics to manage inventory, calculate sales, and monitor customer preferences. These mathematical skills help me make informed decisions and contribute to the tuck-shop's success."*

L2 also said: *"As a high school learner, I frequently apply mathematical concepts to solve real-life problems. For example, I use algebra to calculate my monthly allowance budget, ensuring that I allocate enough funds for pocket money. Additionally, I use geometry and trigonometry when working on projects in practical's, such as building a bookshelf or designing a garden layout."*

L3: *Every day, we use math ideas and abilities learned via problem solving. When we first wake up, we check the time to determine whether we have enough time to attend to numerous tasks. When we brush our teeth, we think about how long the brush will last.*

To what extent do you feel that mathematics helps you think critically and analytically?

L3 *"I believe that mathematics significantly enhances my critical and analytical thinking skills. The process of solving problems requires me to break them down into smaller, manageable parts, analyse patterns, and apply logical reasoning. This approach helps me tackle challenges not only in math but also in other areas of my life, such as science and even everyday decision-making."*

Can you give an example of a time when you used math to solve a problem outside of school?

L1 *"One time, I used math to plan a family journey to our rural areas. I calculated the total distance and estimated travel time based on our average speed. This planning ensured that we arrived at our destination on time."*

How confident are you in managing your personal finances using mathematical skills?

L9 *"I am quite confident in managing my personal finances using mathematical skills. I regularly use basic arithmetic to track my spending, calculate my savings, and plan my budget. Understanding concepts like addition and subtraction also helps me make informed decisions about my savings"*

Have you learned how to create a budget or manage expenses through your math classes?

L6 *"Yes, my math classes have taught me valuable skills for creating a budget and managing expenses. We have covered topics such as percentages, ratios, and financial math, which are directly applicable to budgeting. Additionally, I have learned to use spreadsheets to track my income and expenses, making it easier to manage my finances effectively."*

Describe a situation where you had to make a decision based on mathematical reasoning.

T1 *"Recently, I had to decide whether to buy a new smartphone outright or finance it through monthly payments. I used mathematical reasoning to compare the total cost of both options, taking into account the interest rate on the financing plan. After calculating the overall expenses, I realized that buying the phone outright would save me money in the long run. This helped me make a financially sound decision."*

4.2.2 What is the effect of mathematics education on the development of life skills in secondary school?

In this section, the researcher was seeking to find the effect of mathematics education on the development of life skills. In their interview, the learners were asked whether mathematics help them develop life skills. Learners gave interesting responses. The majority responded positively. Learners were quoted to have said,

L1 *"Mathematics provides the knowledge of calculating. For example, financial literacy such as understanding interest rates, budgeting, buying and selling relies heavily on mathematics"*

L2 *"We can know time and days because of mathematics, we can also plan future events because of the subject"*

Other learners said,

L4 “when cooking at home we need to measure the ingredients that we use so mathematics is important in our life”

To what extent do you feel that mathematics helps you think critically and analytically?

L7: "Mathematics has a profound impact on my ability to think critically and analytically. When solving math problems, I learn to identify patterns, develop logical arguments, and evaluate different approaches. These skills transfer to other areas of my life, helping me to approach challenges methodically and make reasoned decisions."

L13: "I believe that mathematics is essential for developing critical and analytical thinking skills. The discipline of working through mathematical proofs and solving equations trains my mind to approach problems systematically and consider multiple perspectives. This analytical mindset is beneficial in everything from academic research to everyday problem-solving."

L17: "Mathematics has sharpened my critical thinking and analytical skills significantly. The process of deriving solutions from complex equations requires a deep understanding of the underlying principles and careful consideration of each step. This meticulous approach enhances my ability to analyse situations, identify key factors, and develop effective solutions in various contexts."

Can you give an example of a time when you used math to solve a problem outside of school?

T2: "I used math to plan my fitness routine. By calculating my target heart rate based on my age and desired intensity, I was able to design workouts that maximize cardiovascular benefits while ensuring safety. This mathematical approach helped me achieve my fitness goals more effectively."

T4: "When organizing a charity event, I used math to estimate the number of attendees, calculate ticket prices, and budget for expenses. By analysing past data and using statistical methods, I was able to create a financial plan that ensured the event's success and maximized our fundraising efforts."

T1: "During a home renovation project, I used math to calculate the required amount of paint for each room. By measuring the dimensions of the walls and factoring in doors and windows, I was able to purchase the right amount of paint, avoiding both shortages and excess. This careful planning saved time and money."

How confident are you in managing your personal finances using mathematical skills?

T3: "I am very confident in managing my personal finances using mathematical skills. I regularly use budgeting apps that require inputting and analyzing numerical data. Understanding mathematical concepts like interest rates and loan amortization helps me make informed decisions about borrowing and saving."

T4: "My confidence in managing personal finances is quite high, thanks to my strong mathematical foundation. I can calculate my monthly expenses, set realistic savings goals, and analyse investment opportunities. These skills enable me to stay financially secure and plan for the future."

T1: *"I feel confident in my ability to manage personal finances because of my proficiency in math. I use spreadsheets to track my income and expenses, calculate my savings rate, and plan for upcoming expenses. This mathematical approach gives me a clear understanding of my financial situation and helps me make informed decisions."*

Have you learned how to create a budget or manage expenses through your math classes?

L17: *"Yes, my math classes have provided me with the skills to create a budget and manage expenses. We have covered topics such as percentages, ratios, and financial mathematics, which are directly applicable to personal finance. Additionally, projects and assignments often involve real-world scenarios that teach practical budgeting skills."*

L7 *"Absolutely, my math classes have been instrumental in teaching me how to create a budget and manage expenses. We learned to use mathematical tools like spreadsheets and financial calculators, which help in organizing and tracking finances. These skills have been incredibly useful in managing my personal budget."*

L2: *"Through my math classes, I have gained valuable knowledge on budgeting and managing expenses. We often work on problems that involve calculating costs, comparing prices, and analysing financial data. This hands-on experience has made me more adept at handling my personal finances."*

How often do you use math in planning and tracking your spending?

L8: *"I use math daily to plan and track my spending. Every purchase I make is recorded and categorized, allowing me to monitor my budget in real time. This mathematical approach ensures that I stay within my financial limits and make informed spending decisions."*

T1: *"Math is a constant tool in my financial planning. I set aside time each week to review my expenses, update my budget, and analyse my spending patterns. This routine helps me stay on top of my finances and make adjustments as needed."*

T4: *"Planning and tracking my spending involves regular use of mathematical skills. I create monthly budgets, calculate my savings rate, and track my progress toward financial goals. This disciplined approach helps me maintain financial stability and achieve my objectives."*

How helpful do you find mathematical skills in making decisions, whether in academic or personal life?

T3: *"I find mathematical skills incredibly helpful in decision-making. Whether it's analysing data for a research project or comparing loan options for a major purchase, math provides a logical framework that helps me evaluate choices and make informed decisions."*

T4: *"Mathematical skills are essential for making sound decisions in both academic and personal life. From calculating grades and assessing academic progress to managing finances and planning trips, math enables me to approach decisions with confidence and precision."*

T2: *"Math plays a crucial role in my decision-making process. It helps me analyse information, weigh options, and predict outcomes. This analytical approach is valuable in a wide range of situations, from academic projects to everyday choices like budgeting and time management."*

Describe a situation where you had to make a decision based on mathematical reasoning.

T4: "Recently, I had to decide whether to lease or buy a car. I used mathematical reasoning to calculate the total cost of both options over several years, including factors like depreciation, maintenance, and interest rates. This analysis helped me determine that leasing was the more cost-effective choice for my situation."

T2: "I once used mathematical reasoning to choose the best phone plan. By comparing the cost per minute, text, and data across different plans, and factoring in my usage patterns, I was able to select the plan that offered the best value for money. This decision saved me a significant amount on my monthly phone bill."

T1: "During a group project, we had to allocate tasks based on each member's strengths and availability. I used mathematical reasoning to create a schedule that optimized everyone's time and ensured the project's timely completion. This organized approach led to a successful and efficient collaboration."

Only a few of them gave a negative response.

A certain learner said,

L20“Mathematics is not important a person can use their brain from God to survive”

4.2.3 What are the factors that pose challenges for the acquisition of life skills in secondary school?

How often do you find mathematical concepts difficult to understand due to their abstract nature?

L7: *"I occasionally find mathematical concepts difficult to understand because of their abstract nature. For example, when we first learned about imaginary numbers, it was challenging to grasp their application and significance."*

L13: *"Quite often, I struggle with understanding abstract mathematical concepts. Topics like vector spaces and equations were particularly difficult because they felt disconnected from real-world applications."*

L11: *"I find abstract mathematical concepts difficult to understand fairly frequently. Concepts like limits and infinity in calculus took me a while to fully comprehend because they are not easily visualized or related to tangible experiences."*

What specific mathematical concepts do you find most challenging? Please provide examples.

L3: *"I find calculus concepts, particularly integration, to be quite challenging. For instance, solving definite integrals with complex functions requires a deep understanding and careful application of integration rules."*

L17: *"Probability and statistics are challenging for me. Understanding how to interpret and calculate different probability distributions, such as normal or binomial distributions, requires a lot of practice and can be confusing."*

L18: *"Abstract algebra is particularly difficult for me. Concepts like group theory and ring theory are hard to visualize and require a high level of abstraction, making them tough to grasp."*

Do you think the current teaching methods used in your math classes are effective in helping you acquire life skills?

L3: *"I think the current teaching methods in my math classes are somewhat effective in helping me acquire life skills. While we do learn important concepts, more emphasis on real-life applications and problem-solving would be beneficial."*

L9: *"The current teaching methods are partially effective. While they cover the necessary theoretical knowledge, I believe incorporating more practical examples and hands-on activities would better prepare us for real-world situations."*

L10: *"I find the current teaching methods to be effective to a certain extent. However, there is room for improvement in making the lessons more relatable to everyday life and demonstrating how mathematical concepts can be applied outside of the classroom."*

What teaching methods or approaches do you think would better support the acquisition of life skills through mathematics?

T1: *"Incorporating project-based learning and real-world problem-solving tasks would better support the acquisition of life skills. For example, having learners work on budgeting projects or analysing statistical data from current events can make math more relevant and practical."*

T2: *"Using a more interactive and hands-on approach, such as incorporating technology and simulations, could enhance our understanding of mathematical concepts. These methods can help bridge the gap between abstract theory and practical application."*

T3: *"Teaching methods that emphasize collaboration and group work could be beneficial. Working with peers on complex problems allows us to share different perspectives and develop communication and teamwork skills, which are valuable in real-life situations."*

Do you have access to adequate resources (textbooks, technology, etc.) to support your mathematics learning?

L3: *"Yes, I have access to adequate resources, such as textbooks and online tools, which support my mathematics learning. However, having more interactive and multimedia resources could enhance the learning experience further."*

L1: *"I have access to some resources, but I feel that additional technology, like graphing calculators and math software, would greatly benefit my learning. Access to these tools would make complex concepts more accessible and easier to understand."*

L7: *"While we have basic resources like textbooks, I think more diverse materials, such as online tutorials, videos, and interactive learning platforms, would better support our mathematics education and help us apply concepts in real-world scenarios."*

How does the availability (or lack) of resources affect your ability to learn mathematics and acquire life skills?

L2: *"The availability of resources positively affects my ability to learn mathematics and acquire life skills. Access to various learning materials and tools enhances my understanding and allows me to apply mathematical concepts in practical ways."*

L7: *"Lack of resources can hinder my learning process and limit my ability to acquire life skills. Without access to technology and diverse learning materials, it's challenging to fully grasp complex concepts and see their real-world applications."*

L18: *"Having adequate resources greatly impacts my ability to learn mathematics effectively. When resources are limited, it becomes difficult to engage with the material and develop the necessary skills to apply math in everyday life."*

4.3.1 What are the solutions to the challenges of acquisition of life skills in secondary school?

Regarding this research question, a lot of strategies were highlighted by all the teachers who were selected in this study. The most commonly used strategies in the schools selected is, the use of a variety of learning techniques to suit different learners learning style. This strategy was also suggested by MacMillan (2018) who says switching from lecture, to discussion then to seat work provides the variety that all learners need in order to stay engaged throughout the lesson. In other words, this strategy is very important since it also captures every learner's different learning style. Whosoever did not understand the concept when the first method was being used can eventually understand it when it has been introduced to him in another way.

The teacher also highlighted that their second preference is breaking down complex task into easy task. This strategy, in my own opinion should have been the first and the most used because slow learners need to be given work and tasks which not very complex as this will motivate them to work. These tasks should be easy and understandable. This goes hand in hand with Hermer (2001)'s suggestion that says teachers should create their own worksheets and exercises which should be understood by learners since sometimes the textbooks used in the classroom are often written for the average as well as the excellent learner's level of reasoning. This, in my own opinion should be the first strategy a teacher should use when dealing with slow learners in mathematics.

Modifying language used to match the level of understanding of learners as well as giving learners some wait time after asking questions to give learners time to think before responding are also other strategies which teachers highlighted which are also very important when dealing with learners.

Surprisingly, it seems as if only one teacher moves at a slow rate when teaching so as to accommodate the rate of thinking of slow learners. This is also very important as learners require patience when being taught.

4.3.0 Discussion

The study is aimed at finding out how mathematics helps in developing life skills. It is also aimed at finding out the different challenges that are faced in the development of life skills through mathematics, if any, as well as revealing the learners' perspectives on how mathematics is important in the development of life skills.

Most of the respondents asserted that mathematics helps them develop life skills. This is in line with Hannula (2020) who asserts that the reality is that we employ mathematics on a regular basis. In our daily lives, mathematics is quite useful and thus, It is important to keep track of how one encounters mathematical applications in everyday life, from the time one wakes up until bedtime. Every day, we use math ideas and abilities learned via problem solving. When we first wake up, we check the time to determine whether we have enough time to attend to numerous tasks. When we brush our teeth, we think about how long the brush will last, how much it will cost, how much paste will cost, and how many new ones are available. Water consumption, availability, conservation, and effective waste water management are all important considerations in this regard.

Research question 2 asked for the effect of mathematics education on the development of life skills in secondary school. Most of the learner responses were positive. This is supported by literature that assert that Mathematics is often viewed as an abstract and theoretical subject. However, it is a discipline that is utilized in various applications in everyday life. Mathematics enables people to analyse, organize, and observe the different activities that are encountered

daily. It is considered as a human creation and provides conceptual tools needed to model, investigate, and understand both the natural and constructed worlds. A mathematical context refers to the familiar situation in which certain mathematical procedures are applicable, and mathematical literacy is citizens' ability to understand and deal with the role that mathematics plays in the world. Mathematics is deeply involved in people's daily activities. It is necessary for life. It exists and is applied everywhere by people in every modern society. The day-to-day tasks of people in their personal lives and in their work environment cannot be accomplished without using mathematics. Thus, it appreciates the fact that mathematics is there in everyday life. (Su, 2020)

4.4 Summary

In this chapter, the researcher presented the data given by the teachers and the learners. The data presented was then analysed. The data was presented in the form of tables. The data was then discussed linking it with the research questions and the literature review.

CHAPTER 5 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter provides a summary of the research as a whole. The conclusion arrived at is also highlighted to answer the research questions mentioned in Chapter 1. Finally, recommendations are also discussed at the end of the chapter for further studies.

5.2 SUMMARY OF CHAPTERS

In this study, the researcher was investigating if mathematics helps in developing life skills. In Chapter 1 the researcher highlighted the background of the study which pointed out how mathematics teaching impacts on the development of life skills. The background was followed by the Problem statement. The researcher went further to discuss the research questions which he wished to answer in his research. The significance of the study is also discussed showing who is going to benefit from the findings of the study. Delimitations of the study are also discussed. These are both geographical and theoretical. Furthermore, the limitations of the study as well the definitions of terms are also highlighted in this chapter. Lastly this chapter is rounded up with a summary of the chapter.

The second chapter reviews the literature on the development of life skills through mathematics. Literature presented reveals the life skills that can be acquired by the teaching of mathematics. Challenges faced in developing life skills through mathematics

were indicated as well as intervention methods where different authors brought out excellent ideas of assisting learners which would totally improve development of life skills through mathematics. Finally, literature on challenges faced by teachers in teaching learners in mathematics at secondary school level is also discussed where most challenges are being discussed by different authors.

In chapter 3, the researcher discusses about the research methodology where he talks about the design he used in this research. This goes on to define the population used in this study as well as explaining why he chose this population. It also discusses about the sample used, including the size of the sample as well as the sampling procedure used in this research clearly outlining the procedures taken to come up with the sample chosen from the population. The data collection procedure as well as the instruments used in the research are also discussed namely the interviews. This chapter also goes on to explain the validation and reliability of the questionnaires and the interviews, as well as the data analysis procedure used in this research. This is followed by the summary of the whole chapter.

In chapter 4, the researcher presents all the data he collected in the form of tables. The data is then analysed and discussion of the findings acquired through the teachers' and the learners' interview guide follow. Here each research question's responses generated from the interview guides are interpreted. All these responses are also analysed and conclusions are drawn. Finally, discussion of the findings follows, being linked with the literature review.

5.3.0 FINDINGS AND CONCLUSION

5.3.1 Research question 1: What life skills can be gained through mathematics education among learners in secondary school?

A majority of the teacher showed that the most commonly used method in teaching learners in secondary schools is the use of variety of learning techniques to suit different learners learning styles. They also modify language used to match the level of understanding of slow learners as well as give slow learners some wait time after asking questions to give them time to think. These are the three strategies being used according to the findings.

Mathematics provides the tools to approach decisions logically and quantitatively. For instance, financial literacy such as understanding interest rates, budgeting, or investing relies heavily on mathematical principles.

Therefore, mathematical education not only contributes to personal financial health but also empowers individuals to make data-driven decisions in various aspects of life.

5.3.2 What is the effect of mathematics education on the development of life skills in secondary school?

The following issues were raised, the problem-solving process in mathematics whether it is working through algebraic equations or applying geometric principles provides individuals with strategies that are directly applicable to real-world problems.

5.2.3 What are the factors that pose challenges for the acquisition of life skills in secondary school?

The teachers gave the following challenges?

The class size is too big for teacher to move slowly so that slow learners will catch up.

Learners have negative attitudes towards mathematics. They fear the subject such that they end up absconding the mathematics lesson.

Frequent changes of teachers each term slow down the rate of understanding of learners as each teacher brings his or her own strategies and this confuses learners.

Fear of being accused of child molestation especially if the child needs individual attention.

In conclusion, learner's responses seem to be showing the opposite of what the teachers are saying. Teachers are not adequately helping these learners in the schools. The research has shown that teachers know what to do for learners but are not putting what they know to practice and because of this the development of life skills through mathematics may remain low.

5.4.0 RECOMMENDATIONS

The researcher recommends the teachers to try by all means to help learners in any way possible. This will help slow learners improve in mathematics as well as improve the pass rate in mathematics.

Since teachers showed that they do not normally use this method, the researcher recommends teachers to move slowly to accommodate slow learners when teaching concepts. If time permits, they should go over the concept again at the conclusion of the lesson as well as the next lesson as a flash back so that learners can understand better.

The researcher also recommends the authorities reduce the teacher-learner ratio so that teachers can handle a few learners whom they can closely monitor. This will also allow for individual assessment of learners throughout the concept being taught.

The learners should get a platform where they can say out their grievances to the ministry of education concerning their learning experiences in their classes, where they can be clearly heard and corrective action can be taken so that they learn effectively in their classroom.

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APPENDICES

Appendix A: INTERVIEW FOR LEARNERS

I am a student at Bindura University undertaking a degree program in mathematics. The main aim of the study is to investigate the relevance of Mathematics in development of life skills among secondary school students Harare urban schools. Your cooperation in answering this questionnaire will go a long way in assisting me to come up with an authentic study. Your response shall be treated in the strict confidence and shall be used only for the purpose of this research. Your response is greatly appreciated. Thank you in advance.

Life skills that can be gained through Mathematics education among learners

1. How often do you apply mathematical concepts to solve real-life problems?
2. To what extent do you feel that mathematics helps you think critically and analytically?
4. Can you give an example of a time when you used math to solve a problem outside of school
5. How confident are you in managing your personal finances using mathematical skills?
6. Have you learned how to create a budget or manage expenses through your math classes?
7. How often do you use math in planning and tracking your spending?
7. How helpful do you find mathematical skills in making decisions, whether in academic or personal life?
8. Describe a situation where you had to make a decision based on mathematical reasoning.

The effect of mathematics education on the development of life skills

9. Do you feel that learning math has improved your ability to explain ideas clearly and logically?
10. How often do you work in groups on math-related projects or problems?
11. How comfortable are you in discussing mathematical concepts with your peers?
12. Do you think working on difficult math problems has helped you develop persistence and resilience?
13. How do you usually react when you encounter a challenging math problem?
14. How well do you think mathematics has prepared you to adapt to new situations and challenges?
15. Give an example of a time when your mathematical skills helped you adapt to a new situation
16. What additional life skills do you think could be better addressed through mathematics education?

Challenges faced in acquiring life skills through mathematics

17. How often do you find mathematical concepts difficult to understand due to their abstract nature?
18. What specific mathematical concepts do you find most challenging? Please provide examples.

19.How does math anxiety affect your ability to acquire life skills through mathematics?

20.Do you think the current teaching methods used in your math classes are effective in helping you acquire life skills?

21.What teaching methods or approaches do you think would better support the acquisition of life skills through mathematics?

22.Do you have access to adequate resources (textbooks, technology, etc.) to support your mathematics learning?

23.How does the availability (or lack) of resources affect your ability to learn mathematics and acquire life skills?

24.Do you believe cultural attitudes towards mathematics affect your learning and acquisition of life skills?

Appendix B: INTERVIEW FOR TEACHERS

I am a student at Bindura University undertaking a degree program in mathematics. The main aim of the study is to investigate the relevance of Mathematics in development of life skills among secondary school students Harare urban schools. Your cooperation in answering this questionnaire will go a long way in assisting me to come up with an authentic study. Your response shall be treated in the strict confidence and shall be used only for the purpose of this research. Your response is greatly appreciated. Thank you in advance.

Life skills that can be gained through Mathematics education among learners

1. Do you believe that mathematics education helps develop important life skills?
2. How can math help students develop problem-solving skills?
3. What are some examples of life skills that math can help students develop?
4. Can you identify any life skills you have taught through mathematics? Please specify.
5. How do you incorporate life skills into your math lessons?
6. Can you provide examples of how you've seen students apply mathematical thinking to real-life situations?
7. How do you encourage students to transfer skills learned in math to other subjects and areas of their lives?
8. How do you assess the development of life skills in your math students?

The effect of mathematics education on the development of life skill

9. How have you observed the development of life skills in students as a result of math education?

10. What teaching strategies do you use to ensure that students not only learn mathematical concepts but also develop important life skills?

11. How do you integrate real-world examples into your lessons to highlight the practical use of math in everyday life?

12. Can you provide specific examples of students who have shown significant growth in life skills due to their engagement with math?

13. How do you assess the development of life skills in students within the context of math education?

14. How does math help people understand the world around them?

15. How does math help people succeed in their future careers?

Challenges faced in acquiring life skills through mathematics

16. What are the curriculum-related difficulties you encounter in teaching mathematics?

17. What are the student-based difficulties you encounter in teaching mathematics?

18. What are the parent-based difficulties you encounter in teaching mathematics?

19. What are the material and technology-related difficulties you encounter in teaching mathematics?

20.How does the availability (or lack) of resources affect your ability to learn mathematics and acquire life skills?

21.Overall, how significant do you find the challenges in acquiring life skills through mathematics education?

22.What solutions do you propose to overcome these challenges?

23.Any additional comments or suggestions on improving the acquisition of life skills through mathematics education