BINDURA UNIVERSITY OF SCIENCE EDUCATION

AN INVESTIGATION ON THE FACTORS LEADING TO POOR PERFOMANCE IN SCIENCE SUBJECT SPECIFICALLY CHEMISTRY AND PHYSICS AMONG ORDINARY, THE CASE STUDY OF MAUYA ADVENTIST HIGH SCHOOL.

BY

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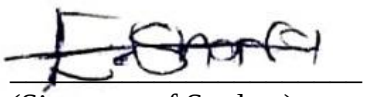

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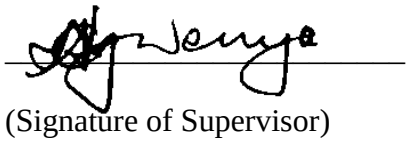

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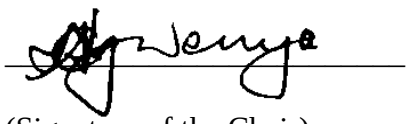

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DEDICATION

I acknowledge the efforts made by my parents, Mr. and Mrs. Shava, to help me pursue my educational goals. We are grateful for your prayers, steadfast love, support, and wisdom. There are not enough words to convey how grateful I am.

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I would like to express my deepest appreciation to my supervisor for their guidance and support throughout the research. Additionally l am deeply indebted to my family for their patience, understanding and encouragement.

ABSTRACT

The purpose of this study was to look into the reasons behind the subpar science performance of ordinary level pupils at Mauya Adventist High School in Murombedzi, with a focus on chemistry and physics. Twenty-four individuals, or 20.6% of the entire population, took part in the study. Thematic analysis was used to analyze the data. The study's conclusions showed that the school is having difficulty keeping the science department's pass rate in chemistry constant. Budgeting for scientific resources and incorporating ICT into the teaching-learning process have been identified as crucial aspects to be addressed among the recommended strategies for procuring laboratory instruments. Finally, the study finds that intervention methods are necessary in order to raise the pass rate. Students' motivation and self-efficacy in science topics can be increased by fostering a positive attitude toward learning, resilience in the face of difficulties, and a belief in the possibility of improvement.

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CHAPTER ONE

1.1 Introduction

This research has been motivated by the poor performances in science subjects among ordinary level students at Mauya Adventist and in Zimbabwe at large. Using the Ministry of Primary and Secondary schools of Zimbabwe statistics for example from 2010 to 2029,where did this information come from? it is undeniable that many students in many schools are finding it hard to perform well in science subjects which include but not limited to physics, chemistry, biology and many others. However, from a problem tree analysis, poor performance is a problem and need less attention that the root causes. As a result, this current study is aimed at investigating the causal factors contributing to the stunted performance in science subjects. Special attention will be directed to the performance in chemistry and physics among ordinary level students at Mauya Adventist High school. You need to say the contents of the chapter

1.2 Background of the study

One of the disciplines that shapes the world is science, which is required of students in many educational systems. Applied knowledge is the definition of science. This is an area of study that affects what we do on a daily basis. Stated differently, it is a tool that is essential to the survival and fulfillment of the demands of the global economy for both individuals and the country as a whole (Mwenda, 2013). This suggests that scientific courses will always be among the most crucial as the world is currently at a point where science is essential to both economic growth and riches. 2011 Muzah: 2011 Mwaba. Even while science courses are widely acknowledged to be important, many schools still struggle to produce passing grades in the relevant areas. Students' performance in practically all science courses in Zimbabwe is still stunted, endangering the nation's progress. Using data from the Bindura University Baseline Survey conducted between 2010 and 2014, it can be observed that the pass rate for sconcesp subjects has been falling over time. The BUSE Baseline Survey (2015) reports that the pass rates for Mathematics and Sciences fell by 28.5% in 2013 compared to 2012. The most notable decline was in Chemistry, which fell by 3.9%, followed by Human and Social Biology, which fell from 33% to 27%, and Integrated Science, which fell by 1%.The pass rate for science courses fell by 6% in 2021 as well. Hence, this suggests a reduced passing rate (New Zimbabwe.com, 2021). Therefore, it's important to evaluate the underlying causes of ordinary

level pupils' subpar performance in scientific classes. Therefore, the main goal of the current study is to look into what factors lead to subpar performance in the sciences, particularly in chemistry and physics.

Since physics education is a crucial component of the training for many professions (Van Godden and Slater, 1998), there has been debate and research on the topic of student enrollment and performance in physics across the globe (Farmer, 2013). According to Kayiga (2013), despite increased efforts to promote the academic field, science subjects continue to be a burden on Uganda's education system. The 2012 Uganda Certificate of Education (UCE) results showed that science disciplines continued to fare worse than arts subjects. According to a study by Mabula (2012), there is a persistent decline in science-related performance on national examinations for secondary schools, along with a persistent dropout rate. It was found that dropout rates are higher in physics and chemistry than in mathematics and biology, which are required of all O-level students.

Science education in Europe (2011) states that there is a decline in the relative standing of science subject performance among European members, based on international student assessment surveys conducted under agreed conceptual and methodological frameworks with a view to providing policy-oriented indicators. The task of developing a new education strategy for the nation fell to the Uganda Education Commission. Resolving the issue of educational disparities between the nation's racial and geographic groups was one of its primary responsibilities. It is difficult to locate a first grade in this sub county, which continues to perform poorly despite all the incentives and efforts by the government and non-governmental organizations to improve quality and participation in education. This is particularly true in science courses, particularly physics.

Providing high-quality education to develop a pool of qualified human resources is a significant problem for Kenya's educational system. This is evident from pupils' dismal exam results, particularly in science-related areas. All significant stakeholders have the chance to evaluate and influence the advancement of education through the yearly assessment of the education sector. The Kenyan Education Network recognizes that while significant progress has been made, much more work needs to be done to meet the 2030 objectives and targets of the Millennium Development Vision as well as the education for all goals. Failure in science classes will have a significant negative influence on a nation's economy because science and technology are vital to any nation's progress. In Kenya, we need a competency-based

curriculum that is well-defined, sufficient teaching and learning resources, and a supportive learning atmosphere that will enable students to completely realize their cognitive potential and develop the necessary values and skills. "Only 18% of applicants who took the biology exam last year (2017) received at least a grade C. This is a decrease of more than half from 40% of candidates in 2015 and 38% of candidates in 2014 who achieved the same grade. Approximately 50% of the candidates in 2016 received D- and E-grades. Kenya Daily Nation, October 20, 2017.

1.3 PROBLEM STATEMENT

Despite the importance of science subjects such as Chemistry and Physics in providing a strong foundation for further studies and careers in STEM fields, students at Mauya Adventist High School are experiencing poor performance in these subjects at the Ordinary Level examinations. The consistent poor performance raises concerns about the factors contributing to this trend, which may include inadequate resources, ineffective teaching methods, lack of student engagement, or other underlying issues affecting student achievement in these subjects. Understanding the factors that lead to poor performance in Chemistry and Physics at Mauya Adventist High School is crucial for developing targeted interventions to improve student outcomes in these critical subjects

1.4 Significant of the study

This study holds significant importance for Mauya Adventist High School, educators, policymakers, and stakeholders in the education sector

Teachers and students

This will assist in discovering useful teaching techniques and materials to raise students' chemistry and physics performance. To improve their teaching abilities, they can also take advantage of professional development and training possibilities.

Ministry of Primary and Secondary

The results of the study will also benefit the ministry of education since they will allow them to develop focused solutions for the problems that have been recognized as barriers to better performance. The study will pinpoint curriculum areas that require revision or improvement in order to raise the standard of science instruction as a whole.

Bindura University of Science education

The research findings will also be used as future references and to help build efficient teaching methods and resources that will raise the caliber of the university's science education programs.

The researcher

The study's execution and publication of its findings will improve the author's standing as a scholar and authority in scientific teaching. It also gives the author a chance to make a significant contribution to the area and add to the corpus of knowledge in scientific education.

1.5 Objectives

The study's goal was to find out what causes students at Mauya Adventist High to perform poorly in science classes.

- To examine Zimbabwe's science pass rates over the previous five years, with a focus on ordinary level chemistry and physics
- To determine the causes of students performing poorly in science classes, particularly chemistry and physics.
- To recommend actions to enhance students' performance in science classes, particularly physics and chemistry.

1.6 Research questions

- What has been Zimbabwe's pass rate trend in science disciplines, specifically in ordinary level chemistry and physics?
- What are the elements associated with teachers that lead to subpar scientific achievement in pupils at the ordinary level?
- What actions may be taken to help regular level students do better in science classes?

1.7 Proposed data collection methods

- Questionnaire
- Focus group discussions

1.8 Delimitation of the study

Geographical scope

Only pupils who took chemistry and physics at Mauya Adventist High School were included in the study.

Period of the study

The study will cover a period of three years.

The validity of the information will therefore depend on the respondents, as the study's conclusions will be heavily dependent on the information they provided. However, for a variety of reasons, including ignorance, perception, and attitudes, among others, respondents may choose to withhold information, provide inaccurate or incorrect information, or simply decline to answer the researcher's questions.

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1.9 Limitations of the study

Confidentiality and secrecy: A number of educators and administrators encountered difficulties in disclosing the pass rates at their institutions, which may pose a data challenge for the research.

Timeframe: Because the study was only done over a short period of time, it might not have caught long-term patterns or changes.

Resource limitations: The study's sample size, scope, and data gathering techniques were all constrained by a lack of funding.

1.10Assumptions

The researcher makes the assumption that the chosen respondents will assist and supply pertinent data needed for the investigation.

1.11 Organisation of the study

Five chapters comprise this research. As the first chapter, it contains the following topics: the research topic, introduction, study background, problem statement, research objectives, research questions, hypothesis, and value of the study. It also includes definitions of essential terminology and delimitations. The review of related literature is covered in Chapter 2, where several sources with relevant information are explored. The foundation of the study is constructed by using the conceptual and theoretical frameworks related to the subject. In Chapter 4, data collecting, various data formats, and data analysis are covered. In Chapter 3, the methodology for data gathering is examined, along with sample selection from a specific population, data collection tools, and their characteristics. Chapter 5 provides an overview of the entire study, along with recommendations, a conclusion, and topics that warrant additional research.

1.12 Definition of terms

Academic performance

Gibson and Rankin (2015) define as the accomplishment of learning goals. But according to the report, a student's academic performance is determined by how well they score on standardized tests or exams. Put otherwise, it represents the results of the students' evaluations. This study will evaluate students' academic performance based on their average exam scores (whether they receive a pass, credit, or distinction).

Factors

based on the fourth edition of Webster's New World College Dictionary. 2010 Houghton Mifflin Harcourt. All rights reserved. A factor is any combination of events, conditions, etc. that lead to a particular outcome; it is an element or component that defines a thing. Stated differently, a phenomenon that modifies the type, extent, or timing of a consequence. That is, the reason for something.

Physics

Physics, in the words of Tighana (2018), is the science that examines phenomena of quantifiable size and undergoes transformations without altering their fundamental characteristics. Physics is described as a significant science that deals with the fundamental

components of the universe, the forces that these elements exert on one another, and the outcomes that these forces generate in the online encyclopedia Microsoft Encarta.

Chemistry

The scientific study of matter's constitution, characteristics, and reactions is known as chemistry. It is a field of study within natural science that examines the characteristics, makeup, and changes that substances go through.

1.13 Chapter summary

The chapter's main goal was to provide readers with an overview of the topic of the study. The chapter successfully explains and discusses the nature of the current issue, which is low performance in scientific classes at the regular school level. Furthermore, the chapter delineated the research objectives and goals upon which the study's findings will be predicated. The theoretical framework, conceptual framework and empirical reviews will be discussed in the following chapter.

CHAPTER II

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will examine a number of academic works regarding the agents who impact students' success in scientific courses. The chapter will also define the theoretical framework that it will use as a foundation. The chapter will conclude by identifying the research that served as inspiration for the current investigation.

2.2 THEORETICAL FRAMEWORK

2.2.1 The cognitive load theory

According to Kirschner, Kirschner & Paas (2009) and Cooper (1998), cognitive load is the sum of the things that the working memory must process at any one time. According to Anthony and Artino (2008), Merrienboer & Sweller (2005:148), Kirschner et al. (2009), Sweller (1994), and other sources, the working memory can only handle a limited number of new items and store them for a brief amount of time. According to Anthony and Artino (2008), the capacity of the working memory to process and store new knowledge in schemas RIThWssSup more space for new information, which is essential for successful learning.

According to the Cognitive Load Theory, working memory should only be used to the extent necessary (Anthony & Artino, 2008; Kirschner et al., 2009). Additionally, it offers strategies for managing cognitive load and schema building during the learning process (Kirschner et al., 2009). Furthermore, according to Cook (2006):4, the theory mandates that the instructional material match the cognitive resources of the learner. This indicates that everything that is taught to a student needs to fit into his or her limited working memory in order for it to eventually be incorporated into the everlasting and infinite long-term memory (Cook, 2006:4; Kirschner et al., 2009).

2.2.2 Three different forms of cognitive pressures are assumed by the cognitive load theory: relevant, intrinsic, and external cognitive demands.

The knowledge or competence of a student determines the internal cognitive load (d). It depends on the amount of data to be processed concurrently and how these components interact

rather than how instruction is carried out (Merrienboer & Sweller, 2005). The way the work is given to the students determines how much extra cognitive burden they are subjected to. The relevant load is established through rule automation and schema creation (Kirschner et al., 2009; Anthony & Artino, 2008), and it can be changed through instructional intervention (Merrienboer & Sweller, 2005:150; Cooper, 1998).

2.2.3 Theory of the Overlapping Sphere of Influence

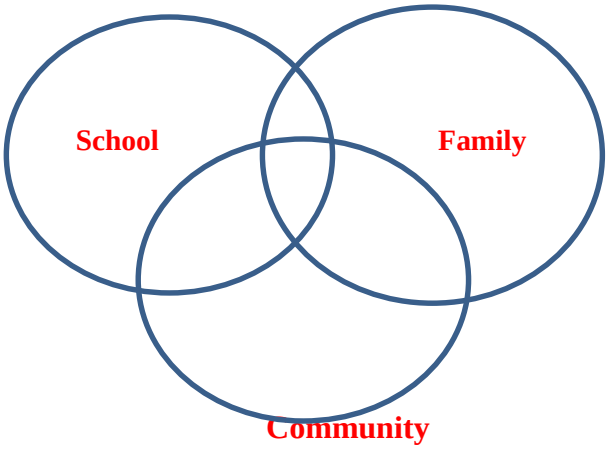


Figure 2. 1: The Theory of the Overlapping Spheres of Influence

According to this theory, learning is a shared interest across the three spheres—the home, the school, and the community—which can all be integrated (Lemmer & Van Wyk, 2010:190). The philosophy holds that the school and the community must have similar educational objectives and cannot exist as separate entities. This helps the community as a whole—parents and students alike—to adjust to school regulations and initiatives and guarantee that all school-related initiatives are carried out effectively. Although objectives can be shared, the community and the school have separate learning procedures and models in actuality (Epstein, 1987:130).

Everyone involved in teaching and learning can communicate effectively by using the Theory of the Overlapping Spheres of Influence, which is predicated on the sharing of educational goals between the home, the school, and the community (Kavanagh, 2013:17). Establishing a partnership between the community and the school involves six acts, according to the notion.

Epstein (1996) lists these activities as decision-making, parenting, communication, volunteering, at-home learning, and community collaboration.

2.3 THE CONCEPT OF ACADEMIC PERFORMANCE

Not just in our nation but in many other nations and continents as well, academic performance is a problem that deeply worries kids, parents, teachers, and authorities. The idea of an academic accomplishment is the first step toward its complexity. Though the terms "school readiness," "academic achievement," and "school performance" are occasionally used interchangeably, semantics primarily explains the conceptual differences between them. Martinez (2007) defines academic achievement as "the product given by the students and it is usually expressed through school grades" using a humanistic perspective. Academic success, according to Caballero et al. (2007), is achieving the targets, goals, and objectives that are specified in the course or program that a student is enrolled in. These are represented by grades, which come from an evaluation that

2.4 THE LEARNING OF SCIENCE

Science is researched for several purposes. According to Paisey (2010), science can be used to understand a wide range of different topics. It serves as the foundation for understanding a variety of concepts in other academic fields. Technology can also improve thanks to science. Without scientific understanding, it would not have been feasible to develop anything from compact discs to the hydrogen bomb (Smit, 2010). Polya (2011) contends that research also benefits us in our daily lives. It benefits us, for instance (Skemp, 2008). Society considers science to be a worthy subject to study because it plays such a large role in our daily lives. In order to foster innovative societies, science education ought to be given top priority in the educational system. Children learn valuable problem-solving techniques from science. It fosters logical thinking in children as well as a more nuanced perspective and analysis of the world. Samuelson (2011) states that a student who is proficient in science has acquired the knowledge and abilities necessary to solve a specific challenge. Making learning enjoyable and worthwhile is also an essential skill. Science will be less scary and more fun for the children when they study it in later grades or forms if the teacher can inspire a desire to learn it in the younger students (Turner and Betts, 2012). But as Gatawa (2008) points out, given the significance of science in the world, it is both a challenge and an endeavor to assist students in overcoming their frustrations (Gatawa,2008). Despite the above-highlighted importance of science in education and life in general, students still struggle in the subject (Lyons, 2008).

According to Skemp (2008), science failure rates in Zimbabwean schools are unacceptablely high. Similarly, Bush (2009) cites numerous research that indicate Zimbabwe has a high percentage of scientific failure.

2.5 CONCEPTUAL FRAMEWORK

Independent variables Dependent variable

Lack of resources
Low teacher to students ratio
Lack of access to information
Lack of practical
andssure and attitude

tudent academic performance

The conceptual framework above shows the elements that influence performance and the consequences that follow during the teaching and learning process.The elements can be divided into three categories: school-based, socioeconomic, and student-related. Poor student mastery content is caused by inadequate stationary, such as books in schools; poor exam results are caused by inadequate laboratory rooms and equipment; students' negative attitudes hinder the advancement of science and technology; incompetent teachers' teaching abilities are diminished; and a lack of in-service training results in poor content delivery.

2.6 FACTORS THAT CAN PROMOTE THE LEARNING OF SCIENCE SUBJECTS

2. 6.1 Involvement

According to Polya (2011), student involvement is one of the most crucial elements for performance improvement. According to Mthethwa (2011), involvement refers to the amount of time, effort, and energy that students put into their studies. An abundance of research data indicates that students who devote more time and energy to their education, as well as engage in it more intensely, will achieve more growth, be more satisfied with their educational experiences, remain in school longer, and be more likely to pursue further education (Umameh, 2011). Pupils who are not actively engaged in the learning process are unlikely to learn

anything at all; when they are viewed as nothing more than passive sensors, they seldom pick up much knowledge. (Obodo (2012)). Students' abilities, motivational tendencies, personal histories, family backgrounds, and community beliefs are brought to the classroom by Bush (2009), and these can enhance or override teachers' contributions, regardless of skill level. According to Osafelintic (2009), a student who approaches science with positivity will not only love learning about it, but will also find satisfaction in the knowledge of scientific concepts that they acquire.According to Obodo (2012), students who have a positive attitude towards science are more likely to be interested in the subject matter being taught and learned. According to Salmon (2010), the majority of scientific instructors fail to make science engaging and practical, which causes students to have unfavorable attitudes toward the subject. According to Sidhu (2006), the main factors that pique and sustain students' interest in science are novelty, utility, and pure intellectual curiosity.

2. 6.2 Attitudinal change

The biggest element that might encourage a high passing percentage in any subject is attitude. According to Umameh (2011), science will no longer look to the student like a dull, uninteresting subject that is increasingly difficult to understand and unhelpful to real-life situations, but rather a subject that will be sought for with genuine attitude change, continuous engagement, and ongoing challenge. In a study on the perception of science among students in secondary schools in rural South Africa, Samuelson (2011) found that students thought teachers without scientific backgrounds were unlikely to be able to assist students in resolving scientific problems. Students also mentioned how challenging it was for certain teachers to assist them because they were not familiar with all of the scientific texts' chapters. Students also revealed that a number of their teachers were skipping class frequently, which prevented them from finishing the curriculum because they had to make up the lost material the following week when they returned. In Zimbabwe, a high failure rate in science was attributed to certain teaching practices that hindered students' ability to gain a conceptual understanding of the subject, according to Nyarumwe et al.'s (2004) study. This might have an impact on how well secondary school students succeed in regular level physics. Institutional, cultural, and social factors influence a student's decision to take physics in high school, even though physics students as a group are generally exceptional—they typically have high grade point averages,

perform well on standardized tests, and tend to rank highly in mathematical ability (Porter & Czujko, 1986). For example, all students at Chicago's Robeson High School, a neighborhood school open to all, are required to take four years of science and four years of mathematics, which includes physics. While intelligent students will typically perform well in most situations, the curriculum or instruction can have a significant role in a student's success when they are taking high school physics and come from diverse backgrounds and learning styles.

2. 6.3 Science teachers qualification and specialisation

According to Olaniyi and Omotoyinimbo (2019), a teacher's credentials have a good impact on students' learning and teaching of physics. Additionally, the caliber of the teacher's preparation and experiences have a significant impact on students' academic success. Due to a lack of teachers, some educators end up teaching subjects in which they are not experts. As a result, they may fail to provide students with effective instruction, which will affect students' performance, particularly in physics. Similar findings were made by Anamuah-Mensah et al. (2017) and Ngman-wara (2015). content comprehension, the instructor's pedagogical skills as a result of insufficient training, the medium of instruction, erroneous and inadequate instructional materials, ineffective school oversight and monitoring, and a lack of excitement for, among other factors. The study also set out to ascertain the professional credentials of individuals who teach the subject and to discover the factors that affect physics performance in ZDMWP's rural schools, since it was unclear from the study if ZDMWP had any competent physics teachers.

2. 6.4 Laboratories and apparatus

Science instruction in secondary schools is impacted by the lack of laboratories and equipment since students are unable to complete practical assignments. A perfect scenario would provide opportunities for extensive laboratory work.Similar findings were made by Ramanian and Hllatswayo (2018), who found that due to laboratory facilities and instructional tools, science teachers frequently struggle to apply research-based learning. Students should study theory and complete practical work; this will inspire them and foster a supportive learning atmosphere. This was further emphasized by Anderson, Holland, and Palinscar (2017), who proposed that science classes be taught in two distinct rooms, one for theory courses and the other for practical practice, placed one behind the other.Nonetheless, a study by Chikwature and Oyedele

(2016) reveals that the majority of rural schools lack laboratories, and in the majority of situations, this has a good correlation with the teaching and learning of physics. Research has shown that a learner's performance in physics is impacted by a lack of laboratories as well as by specialized and subpar laboratory equipment. It is unclear from this study, nevertheless, whether or not rural schools in ZDMWP have labs and equipment. The goal of this study is to determine what is causing students to do poorly in science classes.

2. 6.5 Teaching and learning resources

Studying physics becomes difficult in remote locations due to the lack of school libraries and the high cost of physics textbooks. According to a research by Caillods et al. (2015), students in rural and marginally urban areas of Mexico and Chile frequently lacked textbooks. In certain situations, educators have been known to photocopy their notes and resell them to students for a fee. For secondary schools in rural locations, studying physics might be difficult due to a lack of school libraries and the high cost of physics textbooks. A comparable study by Chikwature and Oyedele (2016) discovered that textbook availability generally has a favorable correlation with physics teaching and learning. Resources are crucial In a research.The purpose of this study is to determine whether these or other factors have an impact on students' performance in physics at ZDMWP rural secondary schools.

2. 6.6 *Lack of parental and community support*

Parents are always underestimated when it comes to education and decision-making, which has an impact on physics studies because parents are such great resource providers for students. A study by Manzo (2016) shows that, because of language barriers, rural Latino parents are not participating in the prevalent forms of parental involvement. In a different study, conducted in 2019, Myende discovered that schools have challenges when parental involvement is required and that school administrators minimize the contributions that rural parents can make while simultaneously viewing them as less valuable. The community and parents must be included because they are crucial to the teaching and learning of science. Chakraborty et al. (2018) claim that education affects changes in the individual as well as the community as a whole. (Samkange 2017; Nyakundi 2016) came to the conclusion that schools become significantly more constricted in the absence of community support and cooperation.

Parents' economic status and Students'Academic Performance.

Zhang (2012) investigated the income of Chinese students and their families. He studied when they were still in lower elementary school. The study evaluated the reading comprehension, verbal communication, and phonological awareness of the participants in relation to the family economic level. The findings demonstrated that children from low-income homes performed worse academically overall and had lower levels of verbal interactions, phonological awareness, and cognitive language skills than their counterparts from middle-class and upper-class families. Additionally, it demonstrated that children from higher-income households had better reading abilities than children from lower-income families, even though the earlier research only looked at early childhood students; the secondary school kids were the focus of this study. In his thorough study, Sean (2013) demonstrates how students from wealthy homes perform better than those from low-income families. The United States of America was the study's location. He proposed that the early stages of a student's education can reveal the influence of their parents' money. According to his theory, parents with greater incomes send their kids off to school earlier than parents with lesser incomes. Since preschool education gives kids the necessary cognitive and social development, their ability to pay for it will have a bigger influence on their subsequent educational outcomes. This is not the case for their low-income counterparts, who would rather have their kids start learning in class one (grade one) instead of preschool. The researcher is aware, meanwhile, that parents with lower incomes want and are just as willing as those with higher incomes to send their kids to school sooner.

2. 6.7 EMPRICAL REVIEW

Jerry (2009) conducted a similar study in Nigeria, where secondary school students' performance in scientific classes was extremely low. Akinola (2006) lists a number of factors that led to this subpar performance, including inadequate science labs and equipment in secondary schools, a dearth of dedicated and qualified teachers, students' incapacity to perform well in practicals, and the teaching strategies employed by the teachers.The majority of

secondary school textbooks are authored by foreign writers who employ sophisticated vocabulary that can be challenging for students to understand.

The following issues have contributed to the deterioration in Malawi's low science performance: a lack of science equipment; a shortage of high-quality text books; the belief that science is a difficult subject; students' laziness; and insufficient time allotted for practical instruction (Dzana, 2012). An investigation of the causes of high school students' subpar performance was conducted in South Africa. Andile & Moses, 2011), where the underutilization of human potential—particularly that of Black people—was a defining feature of apartheid-era education and training. The areas most severely impacted were science, technology, and mathematics education (Department of Education, DOE, 2001). The researchers divided the causes of subpar performance into two categories: direct influences, which include instructional techniques, comprehension and knowledge of the subject matter, drive and enthusiasm, use of the lab, and incompleteness of the syllabus. The language and roles of parents are examples of indirect impacts. According to Thomas & Pedersen (2003), there is a widespread belief in the teaching profession that one should teach as they were taught.This implies that, for instance, a teacher who received an inadequate education will have picked up poor habits and is likely to pass them on to their students. These criteria are relevant to the study since they are similar regardless of the setting. The causes of subpar academic performance in Ogun State Secondary Schools in Asikhia, Nigeria, as perceived by students and instructors (2009). This study looked at how teachers and students in Ogun State, Nigeria, perceived the reasons behind their peers' subpar performance in secondary school.

In their study, "Factors influencing academic performance in ward secondary schools," Cyril and Lucas (2010) examined a sample of schools in Tanzania's Moshi region. Their study's main focus was on the relationship between educators, facilitators, and the learning environment, which encompassed all infrastructure and facilities, the accessibility of resources, and the district-level performance of ward secondary schools. The investigation revealed that none of the district's ward secondary schools were performing very well. Their performance is hampered by a number of issues, including as the small ratio of teachers to students per subject, the absence of a supportive learning environment, and the scarcity of educational resources. Lack of well-stocked libraries and laboratories, poor parent-student contact, and low teacher and student attendance in the classroom were other characteristics linked to this performance. Based on their research, they came to the conclusion that additional data collection is necessary

to make sound generalizations and get a deeper comprehension of the variables influencing academic achievement in Tanzania's ward secondary schools. Relationship between examination practice and curricular objectives in Tanzania was the subject of a study conducted at the Department of Education Psychology and curricular Studies at UDSM (Mkumbo, 2010) by Haki Elimu Tanzania.

A case study by Siwel and Kizito (2012) of Udzungwa Secondary School in Kilolo, Iringa, Tanzania. Their research was motivated by the fact that students' enthusiasm in studying science courses has varied noticeably over time. They specifically sought to ascertain students' preferences for science courses, investigate how teachers and students perceived those preferences, establish a relationship between students' preferences and performance in those courses, pinpoint the impact of preferences on performance, and then make recommendations for how to strengthen that relationship in order to support students' interests in and performance in science courses. Researchers discovered that age of learners, sex, ignorance, lack of learning resources, gender bias by subject teachers, and lack of guidance to students regarding the future importance of science were common causes of students' preference for and poor performance on science subjects at ordinary level in secondary schools. The researchers suggested that adequate teaching and learning resources, such as books, lab equipment, and other supplies, be provided to secondary schools to ensure a conducive learning environment. These are comparable elements that support the present scientific curriculum trend in secondary education in Kenya.

2.7 KNOWLEDGE GAP

The literature mentioned above has demonstrated how important it is for schoolchildren's and the world's general welfare to learn and be taught science disciplines like chemistry and physics. This is due to the fact that studying science gives students and the l.ocal community creative and problem-solving abilities. The pass rate for science topics is still relatively low in many schools, despite the availability of encouraging ways to help students do better. For this reason, it is imperative to look into the underlying causes of the low pass rate.

2.8 CHAPTER SUMMARY

Reviewing the literature in relation to the research problem was the chapter's goal. This has led to the availability of numerous literatures and the identification of the knowledge gap. The chapter has demonstrated the necessity of looking into the underlying causes of the low pass rates in science courses, such as physics and chemistry.

CHAPTER III

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter's objective is to outline and clarify the research techniques applied in this investigation. There will be explanations of key aspects such as the study area, research design, population, sample, data collection techniques, and data analysis techniques.

3.2 STUDY AREA

The Mauya Adventist Church served as the study's location.Like it was carried out in a church? Mauya Adventist is a secondary school located in Mashonaland West province, Zimbabwe's Hurungwe district. The Ministry of Primary and Secondary Education has the school's registration in Hurungwe (MOPSE). There are about 500 pupils enrolled in the school (teacher.ac.zw). There are four courses at the school for each grade level: A, B, C, and D. Form Fours, for instance, consists of Forms 4A, 4B, 4C, AND 4D. Although the precise number of employees is unknown, it is believed to be between 28 and 35.

3.3 RESEARCH DESIGN

The study's research methodology was a qualitative technique. The primary feature of qualitative research is that, although its results are not measurable and quantifiable, it is generally suitable for small samples. Its primary benefit, which also sets it apart from quantitative research, is that it provides a thorough description and analysis of a research subject without restricting the study's scope or the type of responses from participants (Collis & Hussey, 2003). The research design was applied to a small sample of thirty participants in this investigation. Another benefit of this research approach is that it allows the investigator to go further into regions of uncertainty..

3.4 POPULATION

According to Polit and Hungler (2019), the population is the sum of all subjects, objects, or individuals who meet a given set of requirements. Teachers and regular students from Mauya Adventist School in Murombedzi make up the study population.

3.4.1 The eligibility criteria

These requirements outline the qualities that members of the population must have in order to be considered for inclusion in the research (Polit & Hungler 2019). The study's eligibility requirements were that participants had to be either regular students enrolled in science courses or regular teachers of science courses.

3.5 SAMPLING PROCEDURE

This is the procedure wherein a subset of the population is chosen to represent the complete population. Rather than attempting to investigate the full population of students and teachers involved in teaching and learning science courses at Mauya Adventist School, a sample was chosen for this study, saving time.

3.5.1 Purposive sampling

The study used the purposive sampling technique in order to get research findings. Explain the process you used.

3.5.2 Sample size

The larger the sample, the more representative it will be, as stated by Hungler (2019) and Fisher (2005); smaller samples yield less accurate results because they are probably less representative of the population. Twenty-four persons, or 20.6% of the total population, were included in the sample. The basic random digit approach was used to choose the sample.The number of instructors and pupils

3.6 DATA COLLECTION METHODS

The study used in-depth, unstructured interviews to get its desired results. In-depth interviews are informal, introspective conversations with the goal of eliciting participant thoughts, feelings, and opinions about a certain study topic. Further, the benefit of conducting personal interviews is that they reduce the non-response rate and allow for direct and personal interaction between interviewers and interviewees. However, in order to conduct a successful interview, interviewers must possess the requisite skills (Fisher, 2005, Wilson, 2003). It is imperative to use extreme caution during this procedure, though, as the interview may stray from the predetermined goals and objectives of the research (Gill & Johnson, 2002). Additionally, key informant focus groups were employed in the study to mitigate the limitations associated with unstructured interviews. The strategy of using multiple data collection methods was employed to enhance the validity and reliability of the data obtained, in addition to improving the research findings.

Data collection tools

The questionnaire survey.

A questionnaire is a self-report tool used to collect data on factors relevant to a research, according to Cohen (1989). A closed-ended questionnaire intended for this study is intended

to elicit responses. Because the answers to the questionnaires can be readily and immediately compared, they will aid the researcher in easily analysing the data. They are adaptable, allowing surveys to be repeated from one subject to another and conducted among individuals of various ages (Aaker and Day, 1990; kotler, 1994). In a brief amount of time, many questions can be answered.

Advantages of questionnaire

It was time saving

It was easy to administer

It was time saving

Disadvantages

Response biased

Lacked clarity

Interviews

In essence, a structured interview is a questionnaire that the researcher administers or mediates. In order to improve response rates and provide the researcher with a comprehensive comprehension of the students' questionnaire replies, this study employed structured interviews. Interview schedules were carried out with the sample group members. This assisted the researcher in ascertaining the degree of motivation that leads students to choose science courses over those that are more art-related. The purpose of this study was to conduct interviews with the directors of scientific departments and science teachers at the chosen secondary schools in the county. These interviews were conducted in order to determine the primary reason behind the subpar performance of science students and to gather their opinions on the best course of action.

Advantages of interviews

They made it possible for the researcher to get important data regarding people's ideas, perceptions, and feelings. They also provided space for further in-depth inquiries. They

recorded the respondents' own remarks and increased a high response rate. Clarifying uncertainties and understanding the fragmentary responses was simple.

Disadvantages

They can take a long time at times because the setup, interviewing, feedback, and reporting processes are laborious. They are frequently expensive, and the interviewer can comprehend and interpret the interview differently.

3.5 DATA COLLECTION PROCEDURE

Every person participated in the unstructured interviews. Two group conversations were conducted in addition to the focus group sessions. The researcher served as the moderator for both group conversations.

3.7 DATA ANALYSIS

Thematic analysis was employed in the process of data analysis. Based on their characteristics, the collected data were grouped into themes. Additionally, the data analysis procedure made use of Microsoft Excel 2013.

3.8 ETHICAL CONSIDERATIONS

Regarding the participants' assent to participate, each participant signed an assent and Briefing Letter attesting to their written willingness of taking part in the study. Furthermore, participants received complete disclosure about the study's goals and were reassured that their responses would be kept private and used exclusively for the specific research project. Furthermore, no physical or psychological abuse was inflicted against subjects during the course of the study. On the other hand, the researcher made an effort to establish and preserve a cozy environment.

3.9 RESEARCH VALIDITY AND RELIABILITY

The researcher took several steps to guarantee the authenticity and reliability of the study. For instance, the study used a sampling strategy that enables it to produce the desired outcomes. Purposive sampling was the method employed to choose the study's pertinent participant. In addition, the study guarantees respondents' confidentiality and openness in order to obtain accurate and pertinent data. Furthermore, suitable techniques for gathering and analyzing data

were applied to guarantee the validity of the research. To be clear, data collection techniques are also an option.

3.10 CHAPTER SUMMARY

The chapter's goal was to provide an explanation of the research methods applied to the study. The research design, research sample, sampling process, data collecting and analysis, and ethical considerations of the study were all well addressed in this chapter.

CHAPTER IV

RESULTS AND DICUSSIONS

4.1 INTRODUCTION

The main objective of this chapter is to provide a comprehensive analysis of the findings in order to address each research topic. The results will also be contextualized and compared with the outcomes of previous studies on related topics to foster a broader understanding of the research field.

1.4 4.2 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

CHARACTRISTIC FACTOR	DETAILS	TOTAL

Sex	*Male*	13
	Female	11
Age Range Of Students	*15-17*	12
	17-20	5
Age Range Of Teachers	*20-30*	4
	31 – 40	2
	Above 40	0
Level Of Education Of Teachers	*Diploma*	2
	Undergraduate degree	4
	Master's degree	0
Teacher's Experience	*Below 1 year*	1
	1-5 years	3
	5 years and above	2

FIGURE 4. 1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

4.3 PARTICIPATION ANALYSIS

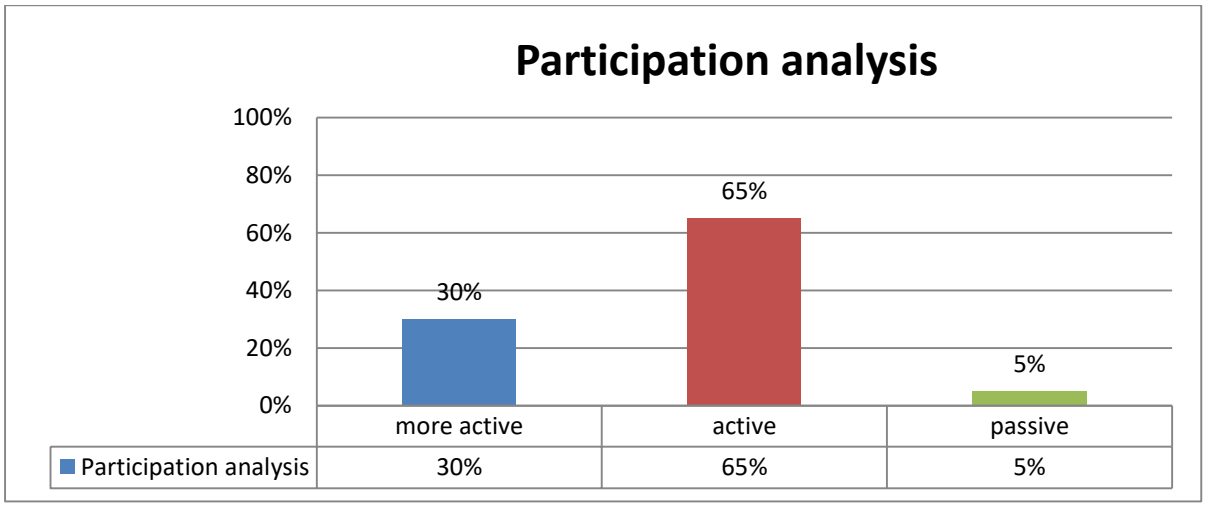


FIGURE 4. 2: PARTICIPATION ANALYSIS OF RESPONDENTS

4.4 SCIENCE PASS RATE ANALYSIS OF ZIMBABWE FROM 2017-2022

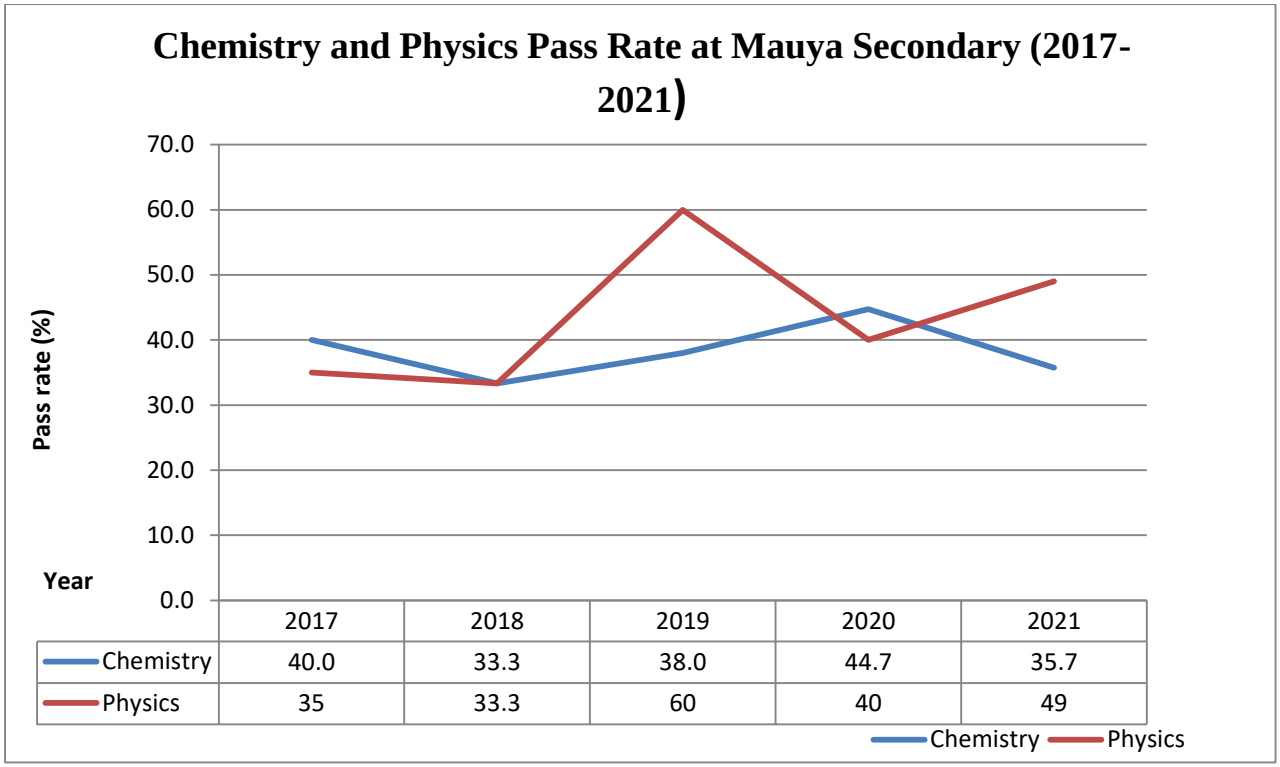


Figure 4. 3: Chemistry and Physics Pass Rate at Mauya Secondary (2017-2021)

The chemistry and physics performance of Mauya Secondary's ordinary level students is displayed in the graph above. In terms of chemistry, the entire graph from 2017 to 2021 is declining despite minor adjustments. 2020 saw a high performance, whereas 2018 saw a low performance. Physics performance appears to be improving; for instance, a 9% rise was noted between 2020 and 2021. But even with the improvement, the performance is still mediocre. Overall, both graphs show poor performance in both subjects, necessitating improvement strategies.

4.5 FCTORS LEADING TO LEARNER'S POOR PERFORMANCE IN SCIENCE SUBJECTS, SPECIFICALLY CHEMISTRY AND PHYSICS

4.5.1 Students' perspective on leading factors to poor performance

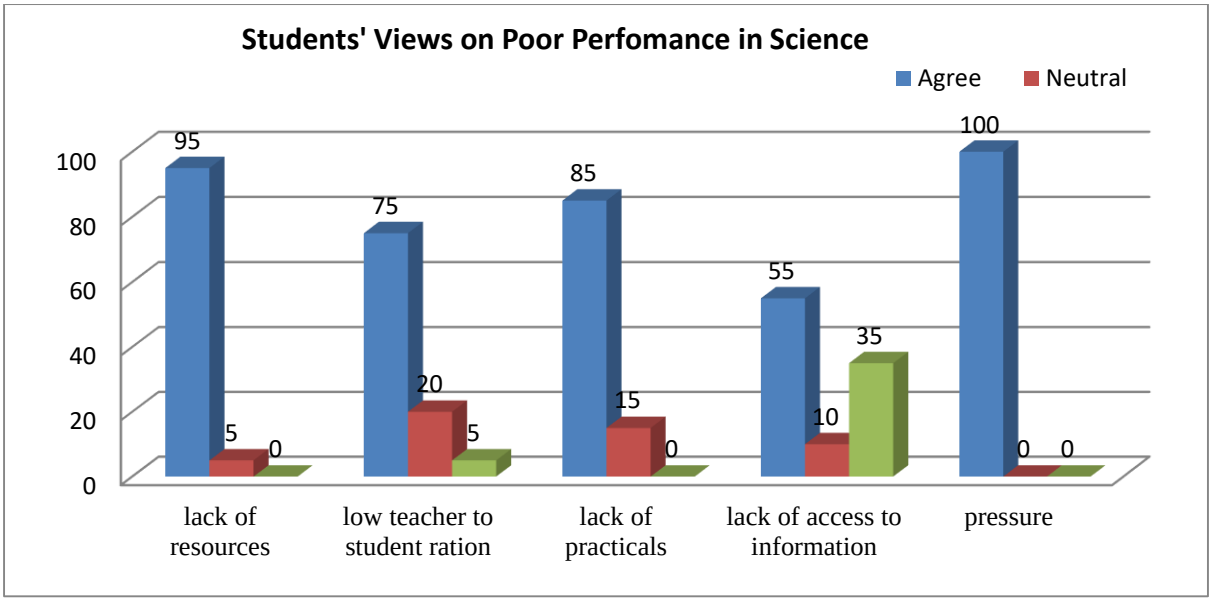


Figure 4. 4: Students' perspective on leading factors to poor performance

The study's findings pointed to several elements that, in the eyes of learners, influence chemical performance. Regarding the availability of resources, 95% of students firmly concur that a lack of resources is one of the main causes of subpar chemistry performance. Lack of reading materials, such as text books, and laboratory equipment for practicals are two examples of the highlighted resource shortfall.

Students also emphasized the low teacher-to-student ratio as a contributing issue. Approximately 78% of students strongly agreed that there aren't enough chemistry teachers in the schools, which limits the amount of time that teachers and students may spend together. Moreover, inadequate performance in chemistry was found to be largely caused by a deficiency of practical knowledge relative to theory. The primary cause of this is a shortage of equipment for the chemistry practical. As a result, a large number of students mentioned that boosting performance in the relevant topic requires consideration of practical factors in addition to theoretical.

Additionally, students noted that inadequate knowledge was another issue contributing to their subpar academic performance. Students emphasized how important it is for the school to have internet access since it can improve their academic performance. Pressure and not having adequate time for each course were also mentioned as difficulties. Approximately 59% of the

students stated that they are short on time, particularly now that the CALA system has been implemented. Students reported feeling more pressure from the system to perform well academically, which has reduced their study time.

4.5.2 Teachers' perspective on poor performance in science subjects

Teachers also noted some of the challenges affecting performance in science disciplines among regular students. The factors that the study's teachers emphasized are depicted in the image below.

Figure 4. 5: Teachers' Perspective on Factors Leading to poor Performance in Science Subjects

4.5.2.1 Lack of resource

As can be seen from the accompanying graph, 95% of teachers believe that a lack of resources is the main issue influencing students' performance in physics and chemistry.One of the professors brought up the issue of the school's extremely low textbook to pupil ratio. The data indicated that the ratio is, on average, 1:7.

During a debate, Teacher A stated, "There is a very poor ratio of textbooks to students." In Form 4A, for instance, seven students share a single book. This influences the process of teaching and learning, for instance, the focus and concentration of the students. Additionally, because they must share the book, kids are unable to study independently.

Teacher D added, "The school lacks proper, well-equipped laboratories for science practicals, other from textbooks. Performance in the experiment-based paper 4s is similarly impacted by this.

4.5.2.2 Pressure from CALA

The study also brought attention to the fact that instructors and students are under more stress as a result of the recently implemented continuous area learning assessment (CALA) system. During a conversation, one of the teachers stated, "CALA's introduction is good in part, but its implementation ignores the time factor." There is pressure on students and teachers to cover certain ideas during the CALA because the allotted time is insufficient.

Thus, the time allotted for the implementation of the CALA system was the primary element that was underlined. According to the system, students must gather information and do study

on every topic for which they registered for ZIMSEC. However, this is influencing how much time students spend studying.

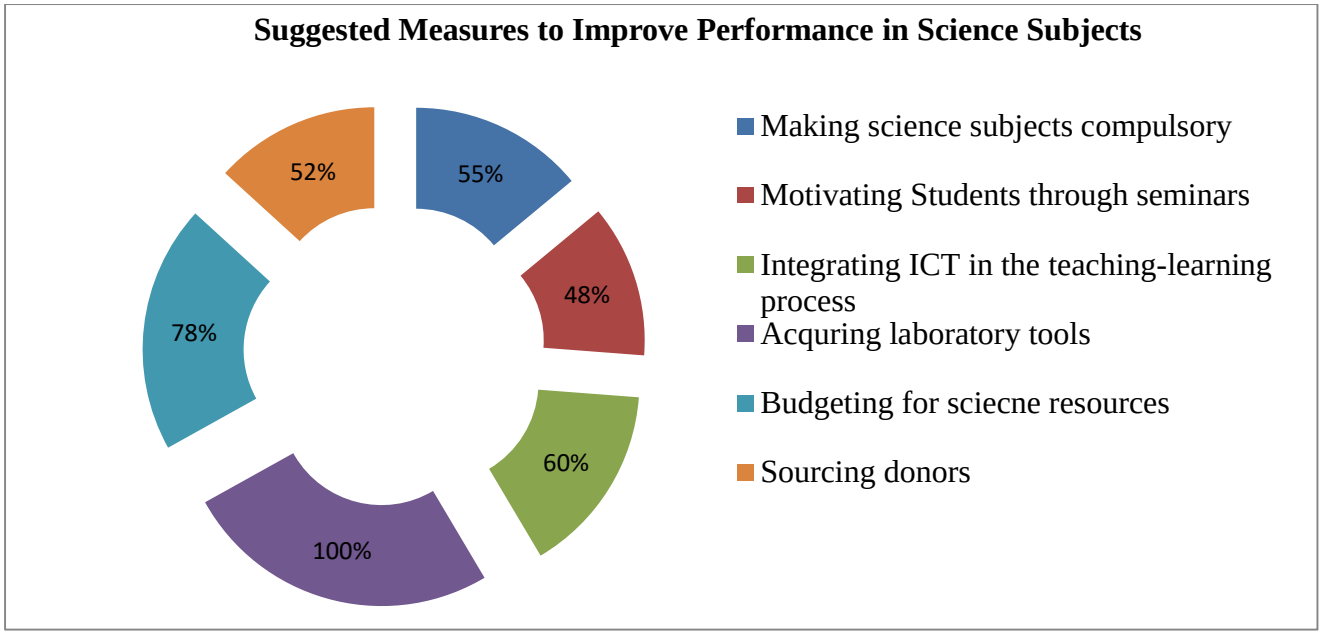
4.5.2.3 Learners' negative attitude

The attitude of students toward science classes, particularly physics and chemistry, was also mentioned as a determinant in performance. Teachers found that most students abandon scientific classes because they think the subjects are too hard, especially for girls. It was noted that as form 4 approaches, students tend to drop out of most science courses, including maths. Therefore, the pass rate in science courses, such as chemistry and physics, is being impacted by the negative attitude.

4.5.4 Poor access to internet

One issue that was brought up was the possibility that students' performance in science classes would be negatively impacted by their lack of internet access. "In this ICT era, internet access helps students to access current and updated data," stated one of the teachers. But without the internet, students are compelled to rely on their limited supply of outdated textbooks. Instructors have demonstrated that increasing students' access to the internet can enhance their performance in science courses. The study also identified other problems, such as inadequate funding for the purchase of necessary equipment, the usage of outdated textbooks, and subpar practical trials as a result of resource scarcity.

4.6 To recommend actions to enhance students' performance in science courses, particularly physics and chemistry.



1.5

Figure 4. 6: Recommendations for actions to enhance science performance

The study's recommended measures are depicted in the pie chart above. Budgeting for science resources and incorporating ICT into the teaching-learning process have been identified as crucial aspects to be addressed among the recommended strategies for procuring laboratory equipment.

4.7 CHAPTER SUMMARY

The study's findings were presented and examined in this chapter. A lot of reasons are contributing to the study subjects' low performance, as evidenced by the data obtained. Potential actions that could enhance the performance in these areas have been proposed. Purchasing lab supplies and setting up ICT services that students can utilize for their education are two of these aspects.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

1.6 5.1 INTRODUCTION

The chapter's goal is to offer a concluding analysis and suggestions on the study's goals and objectives. Therefore, the goals of the research will serve as the basis for both the recommendations and the conclusion.

Summary of the main findings

In Kenya, science courses are essential for high school students. In recent times, there has been a significant failure rate in science disciplines despite efforts to improve performance.

Some of the reasons include:

(i) School-based elements, like insufficient materials for instruction and learning.

(ii) Personal characteristics of the student, such as gender and a poor attitude toward science classes.

(iii) Social-economic variables, such as excessive living expenses and unmet fundamental necessities at home.

Among the solutions to these issues are making sure that all secondary public and private schools have access to the necessary tools and resources to integrate technology into the teaching and learning process; parents should make an effort to meet their children's basic needs; and teachers should provide students with good guidance when selecting elective courses at the form three level. Due to inadequate training, the majority of scientific teachers continue to teach using chalkboards, which results in subpar performance and methodological restrictions in the teaching and learning process. According to recent studies, the majority of science instructors continue to subscribe to the instrumentalist theory that science is just a disorganized body of knowledge that requires memorization of facts, laws, procedures, and skills.

Learning science should be seen as an active process of creating meaningful knowledge as a whole. This suggests that the instructor will act in a way in the classroom that encourages student autonomy and piques their own interest in science. Recent research suggests that an inquiry-based teaching strategy is necessary to help students develop meaningful knowledge

in the sciences. Inquiry-based resources with a hands-on design have demonstrated considerable potential in helping teachers modify their attitudes, beliefs, and classroom conduct during the teaching and learning process. This study looked into the reasons behind students' subpar performance in science classes in secondary schools, as well as whether or not the instructional strategies employed by teachers and students are suitable. The study's underlying hypothesis was that an instructor's degree of freedom in selecting a teaching strategy increased with their familiarity with various learning resources and methodologies. Interactive teaching and learning can be greatly enhanced by employing computer-aided instruction methodologies. One example of such a study is Tilya's (2003) use of MBL in activity-based physics instruction.

1.7 5.2 CONCLUSIONS

The study's findings demonstrated that the institution is struggling to maintain a consistent pass rate in science classes, including chemistry. The results indicate that both individuals' pass rates varied during this period. Chemistry's pass rate ranged from 33% to 44.7%, whereas Physics' ranged from 33.3% to 60%. Nevertheless, despite their diversity, neither subject displayed a consistent tendency of growth or decline over time.

Additionally, determining the causes of the school's lower science pass rate was one of the study's other goals. The findings suggest that multiple factors are involved. From the viewpoint of the student, among the study's contributing components is a deficiency of resources. Low teacher-to-student ratio, pressure from the CALA systems, and a lack of practical activities are the causes of this. However, once teachers voiced their opinions, it was discovered that poor pass rates are brought on by things like a lack of resources, time constraints, students' attitudes toward the sciences, and a lack of professional development.The study concludes that a variety of factors, including those related to students or teachers, contribute to the low pass rate. Nonetheless, pressure and a lack of resources were noted by both groups as important factors.

Finally, the study finds that intervention measures, as indicated by the suggested methods in the study, are necessary to improve the pass rate. Without taking steps to improve teacher quality, acquire resources, and inspire students, the pass rate will continue to be below ideal levels..

1.8 5.3 RECOMMENDATIONS

5.3.1 ***Put differentiated instruction into practice.***

Enhancing student engagement and knowledge can be achieved by identifying and meeting the unique learning requirements of the class through the use of a variety of teaching styles, practical exercises, and extra help for problematic students.

5.3.2 ***Promote real-world applications***

Students' motivation and self-efficacy in science topics can be increased by fostering a positive attitude toward learning, resilience in the face of difficulties, and a belief in the possibility of improvement. Making connections between abstract scientific ideas and useful, real-world situations can increase the relevance and interest of learning.

*5.3.**3 Acquiring resources***

Acquiring resources is necessary to improve learning chances and education. The national or local government should provide funding to schools for the construction of new infrastructure. Parents and other school stakeholders should collaborate to develop innovative programs that will instill creativity in the schoo*l.*

*5.3.**4 Seeking support***

They may submit an application for funding from the government and sponsors in order to obtain the scientific resources required for training and education. The national or local government should provide funding to schools for the construction of new infrastructure. Parents and other school stakeholders should collaborate to develop innovative programs that will instill creativity in the school.

Availability of qualified science teachers and students' academic performance.

The majority of the teachers in Buyengo Sub-County, the researcher discovered, were diploma holders in need of assistance to continue their education. The study also discovered that instructors' poor teaching strategies, lack of attendance, and bad relationships with their students all had an impact on the achievement of the students in Physics. From this vantage point, it was suggested that the government and head teachers support their teachers in improving their academic standing by giving them enough time to study and acquire the abilities necessary for managing students and delivering lessons.

Parents and the school administration should collaborate to find solutions for children' personal issues. Guidance and counseling departments should be established in schools to address concerns raised by students, such as anxiety related to exams and topic selection. At home, parents should be prepared to provide for their children's fundamental requirements.

5.4 Suggested areas for further studies

- In light of this study, we recommended additional research in the following areas:
- In addition to the investigation of science issues, it ought to encompass non-science subjects as well.
- Impact and strategies for changing students' motivation and attitude toward scientific courses should be the focus of future research..

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1.10 APPENDICES

1.11 Questionnaire

Hello, I am Enita Shava, a student at Bindura University. My area of study is **ASSESSMENT OF AN INVESTIGATION ON THE FACTORS LEADING TO POOR PERFOMANCE IN SCIENCE SUBJECTS SPECIFICALLY CHEMISTRY AND PHYSICS AMONG ORDINARY LEVEL.** By answering this questionnaire, you will be assisting us in better understanding the factors that lead to poor performance in physics and chemistry. This is being done in part to satisfy the academic requirements of the university.

Enita Shava

Contact cell: *0782918826/ enitashava@gmail.com*

SECTION A: DEMOGRAPHIC INFORMATION

Please place an X in the appropriate box, if it is by computer, just click the box

Gender	Male	
	Female	
Age of students	15- 17	
	17- 20	
Age range of teachers	20- 30	
	31- 40	
	Above 40	
Level of education of teachers	Diploma	
	Undergraduate degree	
	Master's degree	
Teacher's experience	Below 1 year	
	1- 5 years	
	5 years and above	

SECTION B

OJECTIVE ONE: FACTORS LEADING TO LEARNER'S POOR PERFOMANCE IN SCIENCE SUBJECTS SPECIFICALLY CHEMISTRY AND PHYSICS

Factor	Response
Lack of resources	
Low teacher to student ratio	
Lack practical	
Lack of access to information	
Pressure from CALA	

OBJECTIVE TWO: RECOMMENDATIONS TO ENHANCE STUDENTS PERFORMANCE IN SCIENCE COURSES PARTICULARY PHYSICS AND CHEMISTRY

Measure	Response
Budgeting for science resources	
Acquiring laboratory tools	
Integrating ICT in the teaching learning process	
Motivating students through seminars	
Making science subjects compulsory	

1.12 INTERVIEW QUESTION

What are the elements associated with teachers that lead subpar scientific achievement in pupils at the ordinary level?

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What has been Zimbabwe pass rate trend in science disciplines, specifically in ordinary level chemistry and physics?

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…….

What is the status of physics and chemistry at your school?

……
……
…….

Are the science subjects given special attention compared to other subjects in your school?

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……
……

What is the attitude of students towards physics and chemistry?

……
……
……

* Thank you for support*