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**FACTORS AFFECTING ACADEMIC PERFORMANCE OF ORDINARY LEVEL
STUDENTS IN CHEMISTRY**

BY

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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RELEASE FORM

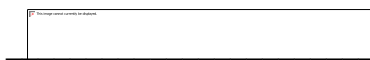
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DEDICATION

This research is dedicated:

To the Almighty God

To my lovely husband Regis Mazivanhanga, my sons Sherman and Shelby Mazivanhanga for their patience, understanding and being my inspirational strength during my studies. May the Almighty God grant them good health, continuity in excelling in their life endeavors and bless them with growth physically and spiritually.

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For always encouraging me to work hard and live my dreams.

To my brothers and my brother in-law Ronald Mazivanhanga

For your Love and Support

To all those who have been praying for me

May God bless you.

DECLARATION OF ORIGINALITY

I, Tauya Fadzai declare that this dissertation is my own work. It represents my own efforts and has not been taken in whole or in part, without reference to whom or from where the information was obtained.

Signature: _____

Date:

ABBREVIATIONS AND ACRONYMS

ZIMSEC Zimbabwe School Examination Council

UNESCO United Nations Educational, Scientific and Cultural Organisation

STEM Science, Technology, Engineering and Mathematics

FGD Focus Group Discussion

ABSTRACT

The study sought to establish the factors affecting academic performance of ordinary level students in Chemistry. A mixed method approach was used which enabled the researcher to explore human behavior. It also enabled me to understand factors causing low pass rate from a holistic view point because it employs a wide variety of methods in its enquiry. Purposive sampling was used to select Chemistry teachers and the students. Data was generated using interviews and questionnaire. The research study has revealed that poor performance in Chemistry is caused by many factors which include lack of experienced teachers and shortage of resources among other factors. The study recommends in service training of teachers to equip them with effective child-centered approaches of teaching and fund raising activities to raise funds that can be used to buy the teaching and learning resources.

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

The present study explored factors affecting academic performance of ordinary level students in chemistry. The main intension was to find out factors leading to poor performance of students in Ordinary level ZIMSEC Chemistry examinations. This chapter presents the background to the study which is about the factors affecting academic performance of students in chemistry. The chapter also presents the purpose of the study, statement of the problem, research questions, significance of the study, delimitations, limitations, assumptions definition of terms organization of the study as well as summary of the chapter focusing on the factors affecting academic performance of students in chemistry

1.2 Background to the study

The government of Zimbabwe launched the Science, Technology, Engineering and Mathematics (STEM) program in a bid to encourage more pupils to take up science subjects at O' level. Chemistry is one of the subjects included in the STEM program.

According to Moyo ,(2017), students view pure sciences as difficult and demanding. Chivore, (2018) postulated that, concepts are considered abstract and hard to relate to everyday life. they also believe pure sciences have limited career opportunities. Students perceive pure sciences as theoretical with limited practical relevance (Makunde 2018). According to ZIMSEC, (2020) the levels of uptake in Biology, Chemistry and Physics at Ordinary level were as follows: 35.6%, 29.4% and 20.5% respectively.

According to Chivore, (2018), pure sciences are taught using different teaching methods these are didactic approach which emphasis on theory over practical application. Moyo, 2017 opined that, lack of contextual learning which involves failure to connect scientific concepts to everyday life. Inadequate assessment is another method, it overemphasis on summative assessments, neglecting formative evaluations (ZIMSEC, 2020).

The challenges faced during teaching pure sciences in Zimbabwe include inadequate resources such as laboratories, equipment and materials hinders practical learning (Moyo, 2017). Another point is that, shortage of specialized science teachers, particularly in rural areas (ZIMSEC, 2020). To add more, outdated curriculum is another challenge which is the

curriculum not aligned with international standards, failing to incorporate modern scientific discoveries (Ncube, 2019). Limited access to technology such as digital resources hinders interactive learning (UNESCO, 2019). Makunde, (2018) postulated that, Socio-Economic Factors such as poverty, hunger, and lack of motivation affect student performance are also challenges in teaching pure sciences.

Many students wrote Chemistry examinations at Ordinary Level at Mucheke High in Masvingo district however, a few managed to pass the subject with at least a grade C. Most of the pupils failed dismally. This had become a trend observed for the past 3 years. The researcher conducted a study to investigate the factors that influence academic performance of students in chemistry, with a goal of identifying key variables that impact their performance in the subject.

The tables below shows the total number of students who registered for pure science subjects at Ordinary level in ZIMSEC examinations and their percentage pass rate in the last three consecutive years (2021-2023) at Mucheke High school in Masvingo district which is in Masvingo province.

Table 1: Student Performance in Ordinary level Physics at Mucheke High School

YEAR	NUMBER OF STUDENTS	PASS RATE (%)
2021	35	15
2022	30	20
2023	20	8

Table 2: Student Performance in Ordinary level Chemistry at Mucheke High School

YEAR	NUMBER OF STUDENTS	PASS RATE (%)
2021	30	5
2022	35	0
2023	22	0

Table 3: Student Performance in Ordinary level Biology at Mucheke High School

YEAR	NUMBER OF STUDENTS	PASS RATE (%)
2021	50	45
2022	45	10
2023	30	8

The data in the tables reveals that chemistry consistently had the lowest percentage pass rate among the three science subjects, trailing behind physics and biology from 2021 to 2023. The low pass rate in chemistry may be due to students' negative attitudes towards the subject. as well as students who seem to be facing challenges of capturing or getting the chemistry concepts due to possible lack of familiarity with language and terms as used in chemistry. An increase in loss of interest in chemistry comes out of difficulties faced by students during the teaching and learning of chemistry subject. Lamidi, (2015) and Omiko, (2017) argue that, some of the reasons for students' poor performance in Chemistry include the deployment of poor instructional strategies and the abstract nature of Chemistry concepts. Ojukwu (2016) posits inadequate number of qualified teachers, shortage of laboratory facilities, poor physical infrastructure, non-availability of instructional materials, and improper utilization of resources hinder academic achievement of the learners. High school and university students in many nations in the world struggle to learn Chemistry due to teachers' inappropriate strategies (Kamisah and Nur, 2013).

Ozel *et al.*, (2013), postulated that since attitudes influence academic achievement of students it is imperative that teachers make their lessons more involving, enjoyable and exciting which can be achieved by learning through the use of videos for example on balancing chemical equations. This is important as attitudes tend to decline over time with continuous build-up of abstract ideas over each other (Metsämuuronen, 2012; Potvin & Hasni, 2014). Negative attitudes and poor performance in chemistry still persist in students because they are facing challenges which have not yet been resolved. These difficulties

According to Sibomana *et al.*, (2021) flexible teachers need to employ innovative teaching methods directly to a conducive classroom environment and which adjust the content to

learners with different backgrounds and talents. Academic achievement relies hugely on teaching and learning, as well as on the fulfilment of the aims of education. Instruction dominated by lecturing does not inspire students to learn and no single teaching method fits all as postulated by Tumay, (2016). Good teaching methods influence students' interest in the topic since good teachers consider students' perspectives by managing and helping them to change their misconceptions about the subject.

1.3 Purpose of study

The study focused on investigating the key factors that influence students' academic performance in chemistry at the Ordinary level.

1.4 Problem statement

There is an alarming statistics which shows poor performance of secondary schools in chemistry subject for schools in Zimbabwe. The problem has been rising with time from 2021 to date. Form four chemistry ZIMSEC examinations results show that the pass rate has been 0%. Studies have been done concerning wide range of anticipated factors affecting good chemistry performance in National examination such as availability of chemistry facilities in secondary schools (Maina, 2009) and how teaching environment can affect performance in secondary schools (Gwambombo 2013). However the problem continues to prevail despite several researches. Ordinary level chemistry ZIMSEC examinations should at least be above 50% pass rate so as to achieve the desired future. From the year 2021 to 2023, the results show a clear discrepancy or gap between what is expected versus what is happening. Hence this is the crucial problem to be researched on. The study is going to focus on the factors affect academic performance of Ordinary Level students in chemistry.

1.5 Main research questions

1. What are the factors affecting factors affecting academic performance of ordinary level students in chemistry?
2. What are the main causes of such factors?
3. How can academic performance of Ordinary students in Chemistry be improved?

1.6 Research objectives

The research was driven by the following objectives:

1. To identify factors leading to poor performance of students in Ordinary level ZIMSEC Chemistry examinations.
2. To analyze teacher and students' perceptions on poor performance in Ordinary level ZIMSEC chemistry examination.
3. To suggest ways of improving the Ordinary Level Chemistry ZIMSEC examinations pass rates

1.7 Assumptions

The researcher assumed that:

- Students' prior knowledge and understanding of basic chemistry concepts will impact their performance in Ordinary level Chemistry.
- The quality of teaching and instruction including the teacher's subject matter, expertise and pedagogical skills will influence students' performance

1.8 Significance of study

The study benefits the following:

Science teachers

Science teachers may find this study beneficial as it informs them to revisit their pedagogical approaches, encouraging those in difficult work conditions to improvise, create supportive technologies in collaboration with their students, right from their surroundings in order to have a better learning experience.

School administrators

Through this study school administrators can learn and arrange professional development sessions with teachers to help them acquire necessary pedagogical skills for efficient teaching.

Learners

The study may also benefit learners by improving their academic performance.

Curriculum designers

This work may also inform decision makers in relevant ministries (curriculum designers) who are responsible for setting policies, guidelines for school management systems, including trustees, principals and school board officials.

1.9 Limitations

Since social science researches on human aspects of the world depend on human beings as their major source of information, they are therefore, subjected to many factors oriented to human consent and understanding. The following are some of the major problems that are being faced during the research process; some respondents are being overly ambitious and allowing their personal feelings to influence their responses, which is creating biases that are affecting the accuracy of the data. More so, results cannot be generalized to all schools in Masvingo since they differ in geographical location and availability of resources.

1.10 Delimitations

The study put its delimitations in terms of study area and period of investigation. Mucheke High was selected to be the study area due to the fact that, Masvingo Province is one of the regions with the largest number of schools and students. Moreover, the study focuses on Chemistry ZIMSEC examinations results from 2021 to 2023 in order to cover current trend of performance. Furthermore, it was in this range where chemistry pass rates were below 50% in three years continually.

1.11 Definition of terms

The following terms are defined as used in this study

Chemistry is the scientific study of the properties and behavior of matter.

Academic performance is the measurement of student achievement across various academic subjects.

Motivation

Motivation is the act of being motivated or being caused to do something. In this research motivation are incentives which cause either chemistry students or chemistry teachers in secondary school to act positively on the subject.

Laboratory

Laboratory is a room or building for scientific research and experiments.

Constraints

Constraints are the things which affect performance in negative way example lack of competent teachers in secondary schools.

Innovative teaching methods

Refer to unconventional, creative, and evidence based approaches to education that deviate from traditional lecturing and memorization techniques.

Misconception in chemistry

These are common misunderstanding or incorrect assumptions about chemical concepts.

1.12 Organization of study

Chapter one of the study discusses the background of the study, purpose of the study, statement of the problem, research questions, research objectives, assumptions, significance of the study, limitations, delimitations and definition of key terms. Chapter two discusses the literature related to the study. The review involves theoretical studies related to the problem under study. Chapter three describes the methodology. Specifically, the research design, the research instrument, sample and sampling technique, the procedures for data collection and the data analysis. Chapter four gives the analysis and presentation of the quantitative and qualitative data. Chapter five summarizes the whole study with conclusions, implications, and recommendations and suggests areas for further research.

1.13 Chapter Summary

The main aim of this chapter was to introduce the reader to the major concepts of the study that include background of the study, statement of the problem, purpose of the study, research questions, significance of the study, assumptions to the study, delimitation of the study, limitation of the study, definition of key terms and finally chapter summary. The next chapter presents the related literature to the study. This literature review will be addressing the research questions.

CHAPTER 2 REVIEW OF RELATED LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the literature related to the specific objectives of the study. It reviews literature about the learning situation. Also, it highlights the theories of learning sciences, some issues relating to performance in secondary schools, what other researchers have written about the subject and the gap requiring further research.

2.2 Theories and perspectives concerning the teaching and learning of science subjects

The study is focusing on the following theories Bandura's theory and Piaget's Theory of Constructivism. According to Herr, (2010), active learning is a set of strategies that places the responsibility of learning to the student. Discovery learning, problem-based learning, experiential learning, and inquiry-based instruction are examples of active learning. In Zimbabwe, this is hardly practiced due to lack of facilities, qualified teachers and Laboratory Technicians.

Bandura's theory emphasis on one's cognition and suggests that the mind is an active force that constructs one's reality selectively, encodes information, performs behavior based on values and expectations and impose structure on its own actions (Alos *et al.*, 2015). It is by understanding the processes involved in building reality that people's behavior can be understood, predicted and changed. In view of the theory, the academic performance of the student is a product of the interaction of his personality and therefore of his study behavior based on his expectations of the results of his actions. Bandura's theory of social learning stresses the importance of observing and modeling other people's behaviors, attitudes and emotional reactions. Bandura stated that learning would be extremely difficult if people only had to rely on the effects of their own actions to inform them what to do (Alos *et al.*, 2015). Fortunately, most human behavior is observed by modeling, by observing others, one has an idea of how new behaviors are performed and this coded information serves as a guide for action later on. The theory of social learning explains the continuous reciprocal interaction between cognitive, behavioral, and environmental influences of human behavior.

According to Alos *et al.*, (2015), one of the difficulties in teaching all types of students lies in the student's ability to grasp new concepts and make learning lasting for those whose assimilation rates are not as fast as expected. It is often the teacher that gives students the atmosphere to learn.

Students learn through any of the five senses, but the three most valuable are vision, hearing, and touch. Theorists and practitioners claim that learners have a preference for one learning style over another. Herr, (2010) postulated that, visual learners learn best by watching, while auditory learners learn best by verbal instruction, and kinesthetic learners learn best by manipulation. Teachers often resort to the instructional style that requires the least time and preparation, namely lecture and discussion because of the demands of the profession. Although these may be valuable approaches to teaching and learning, they fail to take advantage of other learning modalities, and marginalize students whose primary modality is visual (Herr, 2010).

.John Flavel argues that learning is maximized when students learn to think and consciously employ strategies to maximize their reasoning and problem solving capabilities. A metacognitive thinker knows when and how he learns best, and employs strategies to overcome barriers to learning. As students learn to regulate and monitor their thought processes and understanding, they learn to adapt to new learning challenges. A major goal of education is to prepare students to be flexible for new problems and settings. “The ability to transfer concepts from school to the work or home environment is a hallmark of a metacognitive thinker,” (Herr, 2010).

Constructivism is a major learning theory, and is particularly applicable to the teaching and learning of chemistry. “Piaget suggested that through accommodation and assimilation, individuals construct new knowledge from their experiences,” (Herr, 2010). Teachers need to develop a curriculum plan that enhances their student's logical and conceptual development. Herr, (2010) viewed constructivism as a learning process in which students actively construct or build new ideas and concepts based upon prior knowledge and new information. The constructivist teacher is one who encourages students to discover principles and construct knowledge within a given framework or structure. Clearly, teachers must emphasize the important role that experiences or links to the adjacent atmosphere play in student education. The role of the teacher is very important instead of giving a lecture, the teacher in this theory functions as a facilitator whose role is to help the student in his or her own understanding, this removes the focus from the teacher and the lecture and affects the student and his or her

learning. Teachers who follow Piaget's constructivism theory must challenge the learners by making them effective critical thinkers. Some teachers' strategies include working together with students and helping to answer each other's questions. Another strategy involves appointing a student to be the expert on a subject and teaching the class. Finally, students can work in groups or pairs and research controversial topics to be presented to the class (Alos *et. al*, 2015). The result of this study indicated that theory of constructivism is a valid factor of students' performance.

Shown in Figure 1 is the conceptual framework of the study. The independent variables of this study are the teaching approach, student-related factors, teaching strategy, teachers' motivation, and learning resources. Meanwhile, the dependent variable of this study is the students' academic performance in Chemistry.

Independent Variable -Dependent Variable

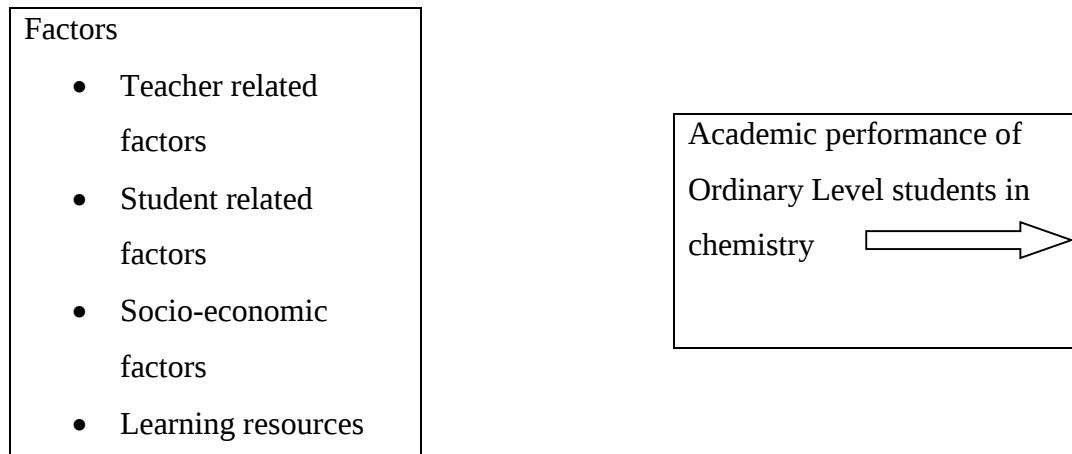


Figure 1 The Conceptual Paradigm Showing the Variables of the Study

2.4 Factors affecting academic performance of students in chemistry.

2.4.1 Home environment factor

Brunello, De Paola & Scoppa, (2010), stated that the home environment has a significant influence in a child's growth and is one of the important aspects in a child's upbringing that is favorably associated to their science performance at school.

2.4.2 Parental factor

De Planty, Coulter-Kern & Duchane, (2017) indicated that parents are their children's first and most essential teachers, and to enable children to perform well and succeed at school, parents should actively engage in their child's education. Rivera, (2010) further indicated that the more engagement and involvement of parents, the higher the child's performance. As indicated by Ceka and Murat, (2016) that in comparison to those whose parental engagement is less helpful, those who have a larger degree of monitoring and supportive mechanisms from their parents will perform well in their academic pursuits. Athey, (2007) mentioned that students learn best when they have the opportunity to participate and interact with their surroundings, particularly their parents who are a crucial component of their environment and serve as their first teacher, and where the earliest learning occurs. Ceka and Murat, (2016) mentioned the significant parental roles as emotional supporters, material providers, and interest builders. Yet, (2012) infers that they are the strongest role model and great influencer of their children. Students always imitate the behavior of parents as well as their values. However, Kasapi, (2013) opined that whenever parents play a positive influence on their children's daily living and most importantly in their education, their future will be more successful.

According to Makgopa & Mokhele, (2013), it is the responsibility of the parents to create a positive conducive environment. This enables students to learn well under conditions that are conducive. Parents must promote an environment in which the students feel comfortable, maintain that comfort that is significant for the learner's concentration, and a lack of comfort may result in problems such as poor attentiveness, which obviously leads to poor performance. Lawson, (2003) claims that when parents do not provide stable and nurturing home environments, their children come to school ill-prepared, and this obviously makes the teacher's job more difficult.

More so, Walker, Shenker & Hoover, (2010) also discussed that parents more engage in their children's education by talking with them about certain events at school, building their curiosity, encouraging them to pursue science and involve practicing interactive homework then, students are more likely to have positive views and attitudes toward sciences and may leads to chemistry academic success. Rivera, (2010) highlighted the active engagement as a parent may usually be overwhelming, frightening or intimidating in participating children related chemistry activities. According to the findings of the study, the impact of parental involvement on student success, parents' attitudes toward academic involvement at home are generally positive. However, Yahya & Ismail, (2011) mentioned that there are also parents who place greater standards for their children and want them to be academically competitive and popular as they grow up.

2.4.3 Teacher related factors

Teacher-related factors are among the factors that influence students' achievement. This has been reported in a study by Muzaffargarh and Ameen, (2018) that the absenteeism of teachers hinders students' achievement for the reason that their absence from school affects the students' progress and concentration on the lessons. The use of lecture-teaching methods and the way teachers perceive the learners' ability and their qualification influence the achievement of students (Ajayi, 2017b; Mahdi, 2014; Ogembo *et al.*, 2015; Okwuduba, 2018). Tumay, (2016) postulated that, instruction dominated by lecturing does not inspire students to learn and no single teaching method fits all, whereas good teaching methods influence students' interest in the topic. Each topic has its own method of content delivery and good teachers consider students' perspectives by managing and helping them to change their misconceptions about the subject. Consequently, strategies of teaching are attractive. They shape students' attitudes positively towards the subject and it is the role of the teacher to manage such factors (Ejidike & Oyelana, 2015; Farzaneh & Nejadansari, 2014).

Furthermore, Okwuduba, (2018) posits that using one teaching method is not good enough because students have different learning styles and they are likely to develop attention when the teaching approaches stimulate their intention to know. In this regard, Chemistry teachers could apply different techniques, in order to optimize students' achievement by involving them in learning activities and by arranging concepts to be taught from simple to complex, so as to facilitate them in understanding the abstract or complex concepts. Students tend to memorize what they are taught without understanding it (Yusuf, 2014). Some teachers adopt

a traditional teaching approach, which is teacher-centered while the students are only a mute and passive audience.

Consequently, the previous knowledge of the learner is not properly activated (Akram *et al.*, 2017). For learners to actively construct meaningful learning there are various instructional approaches that should be adopted by Chemistry teachers. Nkemakolam *et al.*, (2018) opine that no approach can be regarded as the best for every teaching situation. According to Ejidike, Tenaw & Oyelana, (2015), Chemistry teachers should be aware of certain general rules, which facilitate the selection of appropriate approaches for developing skills for students. Such rules for selecting approaches for teaching Chemistry include consideration of the student's age, their previous knowledge of the topic, and their general ability, among other issues. Good teaching methods influence students' interest in the topic (Tolsdorf *et al.*, 2018). Learning is a societal advancement that includes language, everyday situations, communication, and teamwork among learners who are considered to be central in the learning process, which is enhanced by assimilation and accommodation (Amineh & Asl, 2015; Kara, 2018).

Studies have reported that different innovative teaching approaches improve students' achievement in Chemistry, such as cooperative learning; peer teaching, (Amedu and Gudi, 2017) learning hierarchy, Yusuf's, (2014); inquiry teaching strategy, Harcourt (2017); computer simulations, Nkemakolam *et al.*, (2018); problem solving instructional strategies, (Shadrec *et al.*, 2018); Tetrahedral in-zone of Proximal Development (T-ZPD), Yitbarek, (2011). Context-based learning approaches (CBL) also improve students' interest and learning outcomes by the clear linkage between Chemistry, society, research and practice (Vogelzang *et al.*, 2020).

Learners' conceptual understanding was also identified to be developed by the use of the jigsaw model of cooperative learning and consequently, this also enhances students' achievement in Chemistry (Mari & Gumel, 2014). Although most innovative teaching approaches have been reported to be significant in comparison with traditional approaches (lecture methods, in most cases) being applied by some chemistry teachers, there are inconsistent extents regarding the effects of different teaching methods on learners' scholastic accomplishment in Chemistry, depending on the sample and the methods used. For instance, the study of Yuksel, (2014) found that the academic achievement in Chemistry learning was

observed to be related with cognitive and affective characteristics that comprise the nature of students.

According to Mahdi, (2014), effective chemistry teaching that involves learners' active engagement when properly used by teachers leads to socio-economic development, as well as developing the country. Sibomana *et al.*, (2021) state that, flexible teachers need to employ innovative teaching methods directly to a conducive classroom environment, and which adjust the content to learners with different backgrounds and talents. Academic achievement relies hugely on teaching and learning, as well as on the fulfillment of the aims of education.

2.4.4 Availability of Resources

Maina, (2009) studied about the analysis of teaching chemistry in ordinary level secondary schools for performance improvement in Coastal Region. The study found that chemistry teaching was facing the following problems; lack of chemicals, apparatus, expert teachers, and laboratory technicians, as well as large numbers of learners to handle. Mutai, (2006) asserted that Chemistry learning also highly deepened when there are enough reference materials such as textbooks, according to (UNESCO, 2017) which are frequently seen as the primary script that forms the teaching and learning processes, calculators and other supplementary materials as it enrich teaching, engage students in multi-dimensional learning, build students' abilities to apply their knowledge. (Read, Elliott & Corrie, 2015), argued that enough reference materials such as textbooks are critical for chemistry literacy outcomes. Tuimur, (2015) postulated that using it in the classroom can help in the teaching and learning process by effectively explaining new concepts, resulting in a greater ability to comprehend the concepts being taught by the students. Mupa and Chinooneka, (2019) indicated that lack of textbooks and materials has a negative impact on effective teaching. Adeogun, (2011) further said if fundamental instructional resources are insufficient, effective teaching cannot take place in the classroom. According to Banyoko *et al.*, (2016) laboratory adequacy and the school's materials influence the students' achievements. The study suggested that in order to overcome the problems associated with the teaching of chemistry for performance improvement there is a need to strengthen teaching colleges and demonstration schools in terms of facilities, to improve teachers' motivation, to employ laboratory technicians, to revise the current syllabus and to make effective use of professional development programs.

Kibani, (2008) studied the contribution of chemistry practical marks to the overall National Examination results in ordinary level secondary education in Tanzania with reference to Coastal Region. The study revealed that practical marks raise the performance of final examinations by overriding the theory marks. This finding points out the importance of enhancing practical teaching in secondary schools. In order to realize that challenges such as availabilities of Laboratories with all necessary chemicals and apparatus, as well, as enough qualified Laboratory Technicians should be considered.

2.4.5 Students' Attitudes and Motivation

According to Hanson, (2017) one major cause of students' indifference towards Chemistry is the non-connectivity between Chemistry and one's personal life. Some students are incapable of associating Chemical concepts with everyday life and when teachers introduce topics, the students then ask about the importance thereof in their lives. The point in this study is that a student's attitude is a necessary aspect that determines the learner interest in Chemistry subject and its academic performance.

A study by (Nyaga, 2011) points out that negative attitude limits student performance because when motivation to learn is derailed then actual intake of concepts is inhibited. There is actually no guarantee that a learner will be able to understand what is taught in Chemistry through eliminating a negative attitude about the subject. Thus a negative attitude in Chemistry discourages the learner and even limits and even prevents achievement of a positive change and growth. Chemistry learning motivation may influence one's desire to learn new skills and knowledge. This is in line with Kaptan & Timurlenk's (2012) study which found that one of the major obstacles in learning chemistry nowadays is a lack of enthusiasm and interest among students. According to another study by Schulze & Lemmer, (2017), motivated learners are one step ahead of their classmates when it comes to learning. The rate at which students spend their interest, effort, and attention in learning is referred to as motivation. Students have difficulty formulating conclusions after conducting experiments; have low retention of ideas and chemistry knowledge, limited reasoning and analytical skills, lack of laboratory knowledge, inability to design or to use materials, and a lack of interest in and attitude toward science (Sunga & Hermosisima, 2016). They also highlighted, one of the obstacles in chemistry learning is a difficulty with children's cognitive abilities.

2.5 Areas of students' misconceptions in Chemistry

Others students find it to be difficult to learn as a result, they feel that they are ineffective when engaged in it (Graulich, 2015; Hanson, 2017; and Tumay, 2016). Some of the conceptual areas of students' misconceptions are Organic chemistry (O'Dwyer and Childs, 2015); stoichiometry (Shadrec *et al.*, 2018); chemical reactions (Stojanovska *et al.*, 2012); chemical compounds, the oxidation-reduction concept, Adu-Gyamfi *et al.*, (2020); electrochemistry, (Murniningsih *et al.*, 2020); hybrid orbitals and chemical solutions (Broman *et al.*, 2018). The above views may differ from one person to another, depending on the learning environment. Taking organic chemistry as difficult to learn for students depends on its nature, like the three dimensions of thinking and the specific vocabulary to be used (Tenaw, 2015). According to Graulich, (2015) the nature of Chemistry concepts and the technique of their representation in terms of macroscopic and microscopic conflict with the nature of science regarding their methods of teaching what is taken by Organic chemists for approval in their particular problem-solving is not similar to how students answer questions (there are no algorithms for solving problems in Organic Chemistry); but problem-solving depends more frequently on the mediating trends in reactivity, developing mechanisms to analyze chemical calculations).

2.6 Research gaps

Most studies focused on teacher related factors, lack of resources, parental support and students' attitude and motivation. Research gaps under the study include economic factor, impact of teacher professional development on student performance in chemistry, strategies that teachers can use to enhance parent involvement in chemistry education. The study is going to cover on economic factor and the impact of teacher professional development on student performance in chemistry.

2.7 Chapter summary

This chapter examined the various factors that influence the academic performance of Ordinary level students in Chemistry. The factors identified include student related factors, parental support, resource related factors and teacher related factors. The review of the literature revealed that these factors interact and influence one another and their impact on

academic performance can vary depending on the context. The chapter highlights the need for multifaceted approach to improve student outcomes in chemistry subject.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents a discussion of the research procedure that was followed in the study. This includes the research design, population and sampling procedures, research instruments used and data analysis procedures.

3.2 Mixed method Approach

The study used a mixed method approach,(qualitative and quantitative approach). Qualitative research enabled the researcher to gain a rich and in-depth understanding of the respondents' perspectives and experiences. According to Creswell , (2010) qualitative research quest to understanding the nature of the investigation by entering the field of perception of participants, seeing how they experience, live, and display the situation, and looking for the meaning of the participants` experiences. According to Leedy & Ormrod (2019), quantitative research is a systematic and objective approach to research, focusing on numerical data collection and analysis to answer research questions or test hypothesis. It focuses on quantifying the collection and analysis of data.

3.3 Research design

Research design is a way of gathering the information about a given problem through the collection of evidence from various parties. This means that the researcher will design a specific way of finding out the course of a given problem and think of a solution. It helps in setting up a study in a way that produces effective answers to specific questions. The researcher used a qualitative and quantitative approach to determine the factors affecting academic performance of students in Chemistry. This allowed the researcher to find an in-depth understanding from respondents. Green and Tull (2010) noted that, research design is a way to systematically solve the research problem. It may be understood as a science of studying how the research is done. Collection and analysis of two separate quantitative and qualitative data was done, followed with merging them for the purpose of comparing or combining the results (Creswell & Clark, 2017).

The researcher used questionnaire survey in the quantitative phase of the study in order to obtain the numerical data on participants' perceptions, learning experiences and confidence levels in learning chemistry using simulations. Questionnaire surveys are swift in the sense that they can reach a large number of participants or population while providing standardized

and quantifiable data which would also offer a near perfect reflection of how an entire population would have responded to the same study (Cohen et al., 2018). While dealing with numerical findings, the researcher would be able to probe questions to the participants to get in depth information which would verify patterns or tendencies discovered in both strands which are qualitative and quantitative part of the study.

3.4 Sample and Sampling procedure

3.4.1 Sample

Sample consisted of thirty students and 2 teachers from Mucheke High School. The sample ensured generalizability of the study but also minimizing possibilities of having random errors (Marshall, 1996; Mullinix *et al.*, 2015).

3.4.2 Sampling Technique

The purposive sampling was utilized in choosing the participants who are information rich. It also presents multiple perspectives of individuals to represent and display different dimensions (Creswell, 2009). The quantitative phase used random sampling. The respondents of this study were the students in form 3 and in form 4 with a large number of samples approximately 30 students. The study population consisted of 2 Chemistry teachers from a specific school. According to Burns and Grove (1997), a population is a well-defined collection of individuals or objects with similar characteristics. A random sample of eight chemistry teachers was selected for the study, using simple random sampling. This method ensures equal chances of selection for all participants, reducing bias and ensuring representation (Cohen *et al.*, 2010).

3.5 Data Collection Methods/Instruments

The researcher employed interviews and questionnaire to collect data. These methods were chosen for their ability to provide clarity and avoid misinterpretation. Interviews offer in-depth understanding and insights into individuals' think and feel about a topic and why they hold certain opinion.

3.5.1 Interviews

The qualitative research interview seeks to describe the meanings of central themes in the life world of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say. Interviews are particularly useful for getting the story behind a participant's experiences.

According to Kothari (2011) interviews provide a method of data collection that involves presenting oral-verbal stimulate and collecting the oral-verbal response. In this personal interview, the interviewer would work directly with the respondent and has the opportunity to probe or ask follow up questions. Interviews usually achieve a high response rate and more detailed questions can be asked. However, some interviewees may be less self-conscious in a one-to-one situation. They can also be costly since the researcher has to travel to the informants. There can be lack of understanding of the question by the informant or lack of understanding of the respondent's answer by the interviewer.

3.5.2 Questionnaire

A questionnaire was formulated as a research instrument to collect the data quantitatively pertaining to the factors that are associated to the academic performance of Mucheke High School Students in Chemistry subject. The questionnaire was likewise validated by three experts. Pilot testing was executed to ascertain the reliability of the instrument to be used for collecting data by administering it to form 3 and 4 students who were not included in the actual quantitative respondents. The data were then analyzed for reliability testing.

3.6 Data analysis methods/instruments

3.6.1 Data from interviews

Interviews were used to gather information from the key informants such as Chemistry teachers by using interview guides. The data was presented in the next chapter in narrative form using themes. Data from each participant was transcribed during the interview and participants were given codes of confidentiality reasons. The data was collected through hand written notes and recording. The researcher grouped responses according to the nature of the response from each respondent. Pseudonyms were used to identify respondents. Finally, the transcription for each respondent collapsed into narrative form to provide a summary of the data.

3.6.2 Data from questionnaire

Questionnaires were used to collect information from the respondents who were Form Three and form four Chemistry students. This helped to get their perspectives with regards to the specific questions.

3.6.2.1 Likert scale

The researcher used a 5 point Likert scale to measure attitudes of participants in the study. The scale named after its inventor, Rensis Likert in 1932. It gives participants an opportunity to rate their opinions to a degree they find suitable. In an ordinal scale, responses can be rated or ranked, but the distance between responses is not measurable. (Sullivan & Artino Jr, 2013).

Table 4: Likert Scale

Labels in 5 point Likert scale used in this study are as shown in Table 1 below.

Description	Scale
Strongly Agree	5
Agree	4
Neither Agree or Disagree	3
Disagree	2
Strongly Disagree	1

3.7 Reliability and validity

In qualitative research refer to trustworthiness, credibility, transferability, dependability, objectivity. Being a mixed methods research study, issues about rigour in quantitative phase of the study as well as trustworthiness in the qualitative phase present throughout the study from when data was collected to when results were made and thereafter shared. By definition, research rigour is the degree to which researchers have worked so that the quality of study is enhanced (Heale & Twycross, 2015). The researcher ensured research rigour through evaluation of the tools reliability and validity.

Validity refers to what degree is a concept has been accurately measured. The instrument (questionnaire) used in this study was modified to gather data accurately using a scale that give participant wide chance of precisely pin pointing at which level is their level or degree of attitudes falling as per every item provided in the questionnaire.

To ensure validity, the researcher made sure the instrument (questionnaire) clearly measures one attribute which is attitudes of students by including items which specifically look at how students perceive learning of chemistry before and after the intervention. On qualitative, the researcher gave respondents the same questions, and compared each respondent's

performance based on results of the questions outcomes. Again the reliability of the instruments was enhanced through rigorous analysis. Also as advocated by Gray (2010), some informants were subjected to direct questioning to see if their responses matched up with previous answers.

3.8 Pilot study

The researcher sought authority to carry out a pilot study at the school using 10 respondents drawn from each different science subject. The researcher requested the respondents to answer the questions and then commented on the items of each questions. This enabled the researcher to make some amendment on the questions.

3.9 Ethical consideration

Ethical issues refer to research permits/letters, and consent forms in appendices. According to Boss (2015), ethics is a set of standards of rights and wrong established by a particular group and imposed on members of that group as means of regulating and setting limits of standard of behavior. Confidentiality was observed as they were no names used during interviewing and probing other means of identity of participates was no allowed during the research study. Again the researcher sort permission from the Ministry of Education officials clarifying to them her research objectives and how she was going to achieve them and hence she was granted permission to do it.

3.10 Chapter summary

The chapter discussed the research methodology for the purpose of the research. The descriptive research design was chosen due to its ability to allow research to be undertaken in a relatively new area of research to the researcher. The research is to be a mixed method research using qualitative and quantitative methods. Simple random sampling was used in this study. The next chapter holds the analysis, interpretations and discussions of the research findings.

CHAPTER FOUR

4.1 DATA PRESENTATION AND ANALYSIS

The main aim of the study was to establish the factors affecting the performance of chemistry subject, the performance of the subject and collecting opinions and observation of the students and the subject teachers at Mucheke high and possibly how this could be improved. The factors presented and analyzed in this chapter were arrived at, from the information obtained from the questionnaires administered to the chemistry students at ordinary level and their chemistry teachers.

Some of the information was obtained from the interviews and discussion held with some of the above mentioned respondents. From students' questionnaires, the findings indicated that the students' attitude towards chemistry significantly affects performance of the subject. It also established that, the attitude of students towards chemistry had a bearing with their academic levels. This was revealed through the analysis of the chemistry teachers and the attendaof the students in chemistry periods.

4.2 Response Rate and sample

In a quantitative study, the researcher administered 40 questionnaires to respondents, aiming to receive all 40 back, and achieved a 100% response rate as all questionnaires were returned. All returned questionnaires were usable, containing all required information. The researcher also purposefully selected six students to participate in focused group discussions (FGD). Additionally, she conducted a face-to-face interview with two purposefully chosen Chemistry teacher. The focus group discussions and teacher interview were carried out with anonymity in mind therefore, pseudonyms were used, with the teacher referred to as Teacher J and students identified by numbered codes (e.g., Student 3A).

4.3 Demographic Characteristics of the Respondents

.Two male chemistry teachers who were below 40 years were interviewed. The teachers were degree holders and one has 4 years teaching experience and the other 5 years teaching experience. 20 students were administered questionnaires and 10 students were selected to carry out a focus group interview. These students were sampled from a form four and form three classes, their ages ranging between 14 to 19 years of age. Seven students were between 14 -16 years of age while thirteen students aged between 17-19 years.

4.4 Do you have interest in learning chemistry subject?

Interest to the subject can affect the students' efforts or commitment on the particular subject which eventually affects performance in that subject.

4.4.1 Student Interests in Chemistry

The data from interviews and questionnaire showed that, 70% were interested in chemistry subject very much and 30% were not interested so much. Among the three students who did not like chemistry so much, two of them perceive chemistry to be difficult subject while one student did not know the importance of chemistry in his future carrier. Five percent pointed out that they like chemistry subject because of the teacher while 70% considered chemistry subject as import in their future lives.

Figure 2: Students' interest in chemistry

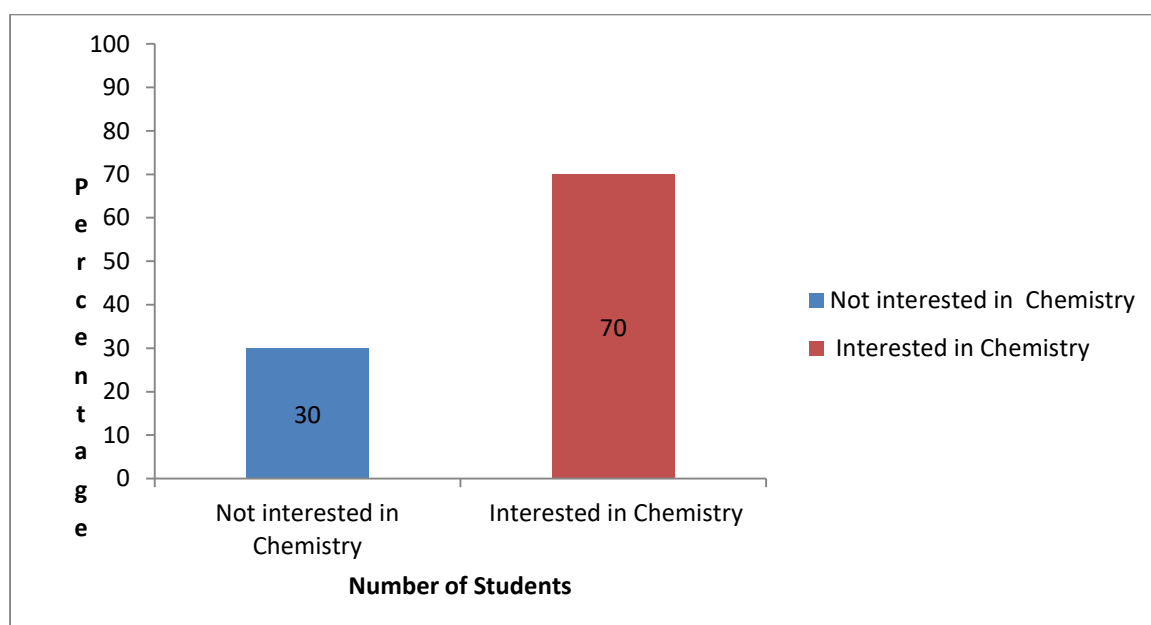


Fig.2 above shows that majority of students studying chemistry like the subject and knows the importance of chemistry in their lives. The results indicate that poor performance in chemistry subject is not mainly due to students' interest on the subject. Even though, these students have not done the form four ZIMSEC examinations they shared almost similar environment with those who have recently sat for the examinations. However, they lost interest in science subjects due to various reasons as identified by this study (Lihaya, 2019). The finding shows that student interest to the subject is dynamic and it has to be measured in relation to other factors.

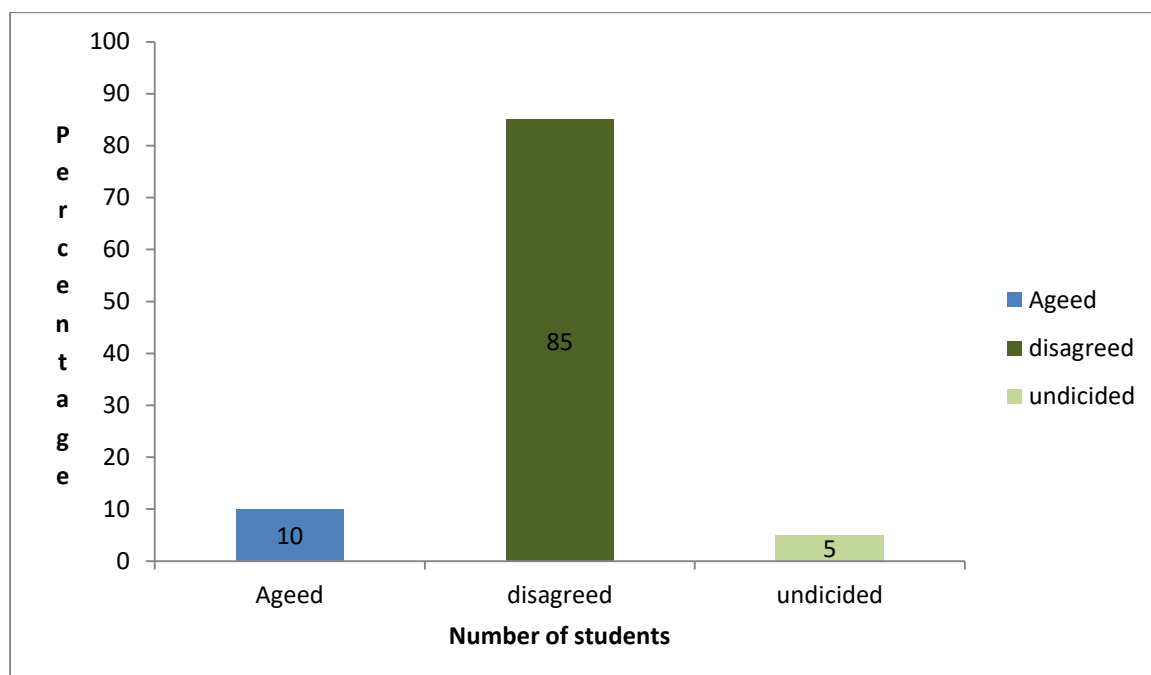
4.5 Does the school motivate the learners?

School motivations create a good environment for students' success in chemistry performance. The most dominant motivation practise in secondary schools is by openly giving gifts to students who perform well in a particular subject

4.5.1 School's Motivation

The study asked students if school motivation engage students in the chemistry subject. 10% agreed, while 85% disagreed and 5% were undecided as shown in fig.3 below.

Figure 3. Does the school provide motivation?



Those who agreed that their schools provide gifts to the best chemistry students mentioned exercise books, mathematical sets and money as common gifts. Motivation as a contributing factor to student performance is very important. Stronger motivations can increase students' morale to the subject. This is in line with the constructivism theory of learning science (Herr, 2010) which emphasizes the importance of encouraging students to discover principles and construct knowledge within a given framework.

4.6 What challenges do you encounter while learning Chemistry?

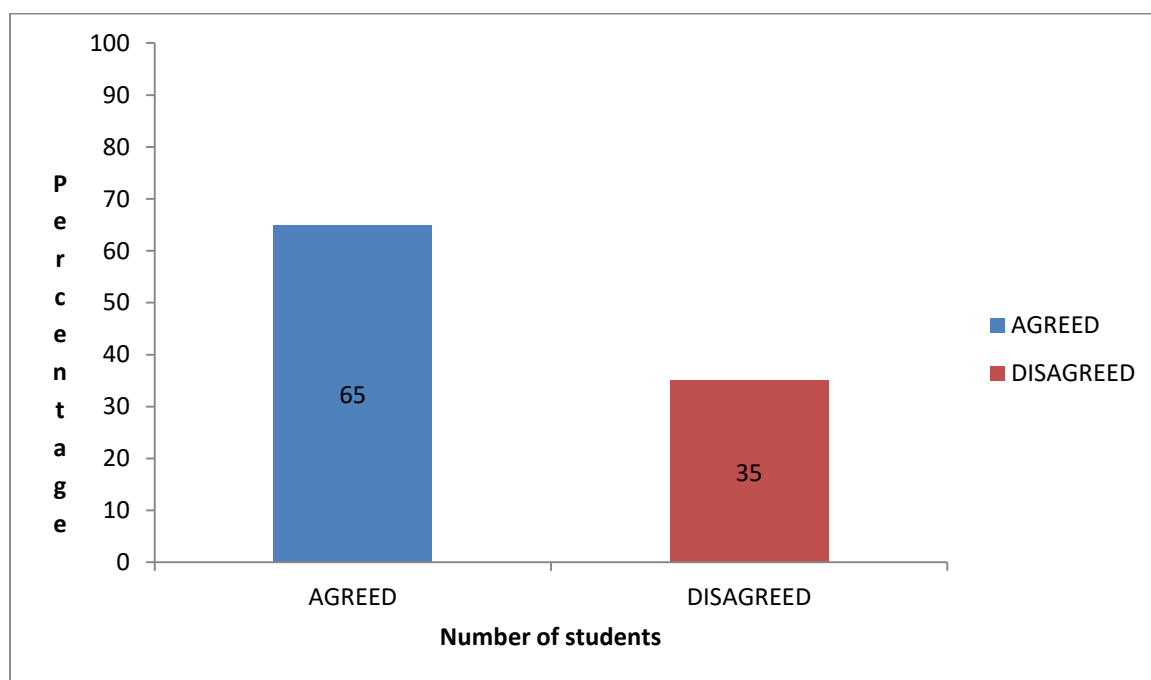
4.6.1 Facility Related Factors

Facilities such as laboratories with all necessary appliances, libraries with all relevant books, student access to books creates good environment for better performances for students in examination. According to the students interviewed the opinions concerning availabilities of apparatus in their school chemistry laboratories; Student B had an opinion that,

‘The school laboratories did not have the necessary chemicals and apparatus and it result in poor performance of chemistry in the ZIMSEC examinations.’

According to results of the students interviewed, 65 % agreed that lack of chemistry facilities such as libraries, chemicals and textbooks is one of the causes of poor performance of chemistry in the ZIMSEC examinations and 35 % disagreed as shown in fig.4 below.

Figure 4. Do facility related factor cause poor performance?

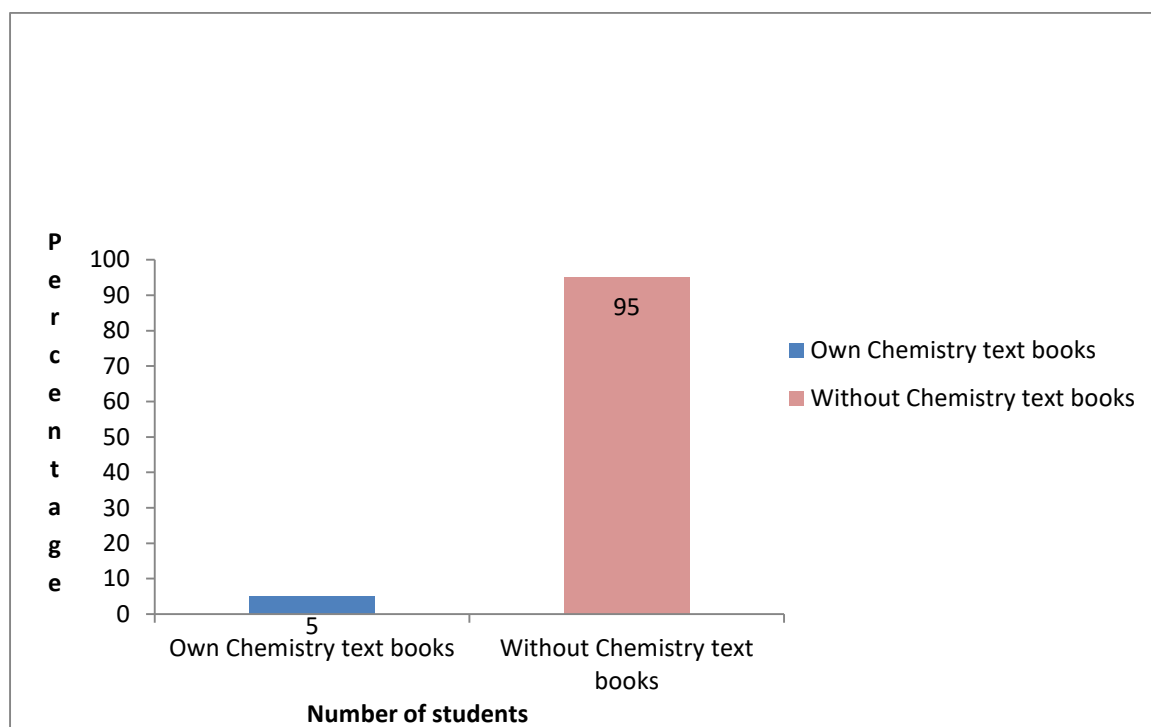


4.6.2 Chemistry Textbooks

The study asked students whether they had their own chemistry text books, 5 students (5%) claimed to have their own chemistry text books while, 95% did not have their own chemistry text books. Among those 5 students who had their own chemistry books; 2 students received those books from their parents, friends or relatives. 2 students showed great interest to the

subject since they bought those books from their own money. One student claimed to receive the books from the teacher.

Figure 5. Number of students owns Chemistry text books



According to the results, it is clear that many parents, friends and relatives of the students interviewed had awareness of the importance of books on students learning but have no source of income to buy texts books. Furthermore, the study asked on the students' awareness about their school provisions of chemistry books to students, by asking them whether their school provided chemistry books to students and some of the students disagreed that their school provides chemistry books to students.

4.6.3. Curriculum Related Factors

Poor performance in the Form Four ZIMSEC examinations especially science subjects like Chemistry has been easily linked with lack of teachers, poor teaching and poor learning environment as dominant anticipated factors. However, there are few systematic researches which focus on the curriculum implementation and examination practices as the major factor. Since 2015, competence based curriculum was implemented which encourages development of certain articulated key competences. A set of standards of resources have been identified for effective implementation of the curriculum. These include a number of teaching and learning resources, such as textbooks, syllabuses, modules and manuals. Few teachers, less than 40% use other items more than books and syllabuses, most of them depend only on books and syllabuses (Mkumbo *et al.* 2012).

In spite of the fact that the Government has been implementing the competence based curriculum since 2015 very few teachers are familiar with the concept and philosophy of the curriculum orientation. Furthermore, the teaching and learning environment is generally poor to support competence based curriculum. Problems on implementing the competence based curriculum can be one of the factors leading to poor performance in the examinations (Mkumbo *et al.* 2012).

The study finding shows that there are poor learning environment in schools. One of the interviewed teacher(TI) pointed out that,

‘There are lack of enough and qualified teachers in schools lack of necessary facilities such as textbooks. He also pointed out that poor teacher class attendances and poor teaching methods also contribute to poor performance’.

4.6.4 Human Resources Related Factors

One chemistry teacher out of two (TJ) who were interviewed when asked about the causes of poor performance in academic achievement in ordinary level chemistry examinations pointed out that;

‘Lack of Chemistry teachers as the major cause. This causes overcrowding of students in classrooms and hinders access of laboratory facilities in practical sessions’.

Furthermore, teacher T J pointed out that,

‘Lack of enough and teachers, is one of the factors that causes poor performances of chemistry. In addition, he suggested that an increase of chemistry subject teachers will improve performance in Ordinary level ZIMSEC examinations’.

4.6.5 Home Based Related Factors

There are several home based factors, such as socio-cultural (e.g. family conflicts) and socio-economic factors like home based poverty which can influence students’ performance on chemistry subjects. However, the study focused on the home based support or encouragement on students’ learning chemistry. The study interviewed students if they get enough support from their home of doing chemistry subject. Student A opined that,

‘Parents give me enough support, they want me to do chemistry but the challenge is on source of income to buy textbooks.

Student C indicated that,

‘The limiting factor mainly was the strictness of their parents. This was especially found in girls who were restricted by parents during their free time. ‘

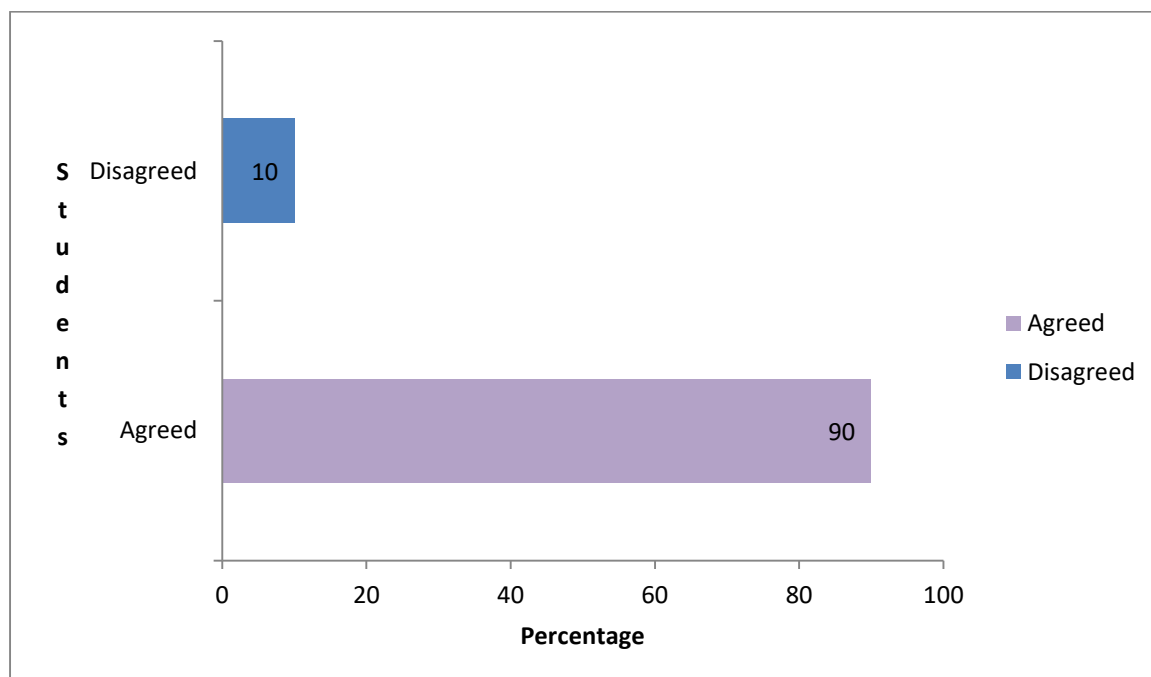
Student C further indicated that,

‘They had limited opportunities to attend educative seminars held in different places due to lack of support.’

4.6.6 Students’ Attitude towards chemistry

The study asked students if attitude towards the subject affects the performance of the subject. 90% agreed and 10% disagreed.

Figure 6. Students’ attitude towards chemistry



Students indicated that they always held discussions with their classmates to solve simple problems in chemistry subject, but they were facing some difficulties in solving hard questions, since they are very few in the chemistry class as most even abscond the periods because of their negative attitude towards the subject.

4.7 Teachers' Perception on Chemistry Performance in the ZIMSEC Examinations

The study asked the teachers about their perceptions on possible reasons for the declining of form four chemistry ZIMSEC examination results. The following are the dominant reasons in percentages as mentioned by the teachers interviewed.

'Because of lack of enough and qualified teachers in schools, poor chemistry teaching and some teachers do not cover the syllabus, poor students awareness on the importance of chemistry subject in their future lives, lack of necessary facilities such as text books, chemicals and other apparatus in school laboratory. Chemistry subject is difficult.'

With reference to the above findings most of the teachers interviewed thought that the foremost possible reasons for the declining of form four ZIMSEC examinations results are lack of awareness on the importance of the subject in their future lives and insufficiency of necessary chemistry subject facilities. These give an overview of students' option of the problem under study which is important in finding the solutions for improving chemistry ZIMSEC examinations performance. This is due to the fact that students are among the major stakeholders in dealing with improving performance. Moreover, the study asked students on their opinions to improve chemistry performance in ZIMSEC examination results. The following are students' suggestions;

'Chemistry teachers should cover the syllabus and make many revisions prior to schools and ZIMSEC examinations, increase time allocation for chemistry subject in school time table, improve students' awareness on the importance of the chemistry subject in their future lives, students to study harder'.

The above findings show that chemistry students interviewed were aware of what should be done to improve their performance. Their responses covered both the roles of chemistry facilities and human resources (teachers), as well as, students' roles to improve chemistry performances.

4.8 Constraints Facing Chemistry Subject

Students interviewed were asked about the constraints facing chemistry subjects. The following are the most mentioned constraints by the students; Lack of enough chemistry teacher, poor chemistry teaching and teachers class attendances, Lack of chemistry related

facilities in schools such as books and laboratories, poor students' awareness of the importance of chemistry subject in their future carriers and Chemistry is a difficult subject.

The above findings show that chemistry students are aware of some of the major constraints facing the subject. This is a good sign for any effective struggle in improving chemistry ZIMSEC examinations results. For example, knowing that lack of chemistry related facilities in schools is a problem in their academic achievement motivates them to utilize effectively the few available facilities, as well as, encourage them to use the facilities when fully available to improve their performance.

The students also added that they have fewer chemistry facilities such as textbooks, laboratory equipment's and instructional materials and others that would encourage their successful chemistry learning. Other students complained about the chemistry teachers. They indicated that, they had shortage of chemistry teachers. They further added that, they were facing difficulties in the methods used by teachers in teaching chemistry subject. During the interview, it was discovered that some of the teachers who were teaching in these schools were not professional teachers. Also students pointed out that, they performed poorly in chemistry because, chemistry as science subject was not as easy as other subjects taught to them, for example religious education, on the variable about the attitudes of students towards chemistry subject, teacher T acknowledged that,

'Many students have negative attitudes towards studying chemistry compared to 'A' level students, had more interest in chemistry. He added that majority of O-level students seems to dislike chemistry and this could be one of the reasons why they performed poorly.'

4.9 Chapter summary

The above chapter presented a comprehensive analysis of the data collected from questionnaires, focus group discussions, and an interview. The data from all three sources was analyzed simultaneously to provide a detailed and integrated understanding. The questionnaire data was visualized in graphs, while the focus group and interview data was presented in a narrative format. The next chapter will provide a summary of the findings, draw conclusions, and offer recommendations based on the study's outcomes.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The major objective of the research was to find out factors affecting academic achievement of chemistry students at ordinary level. The study showed that the pattern of chemistry performance in the ZIMSEC exams in the last three years from 2021 to 2023 was declining at Mucheke High. It also investigated how curriculum, individual students, inadequate resources i.e. teachers and learning facilities have contributed to the continuing poor chemistry performance. It sought to answer key questions with the following objectives:

- I. To analyze teacher and students' perceptions on poor performance in Ordinary level ZIMSEC chemistry examination.
- II. To identify factors leading to poor performance of students in Ordinary level ZIMSEC chemistry examinations

5.2 Factors affecting academic performance of ordinary level students

Performance was treated as dependent variable while factors affecting academic achievement in chemistry were treated as independent variables. These included individual/students related factors, curriculum related factors, human resources related factors, home-based related factors, and facility related factors, schools' motivations and students' perceptions on the chemistry performance.

Furthermore, the factors affecting chemistry performances in secondary school are not only, insufficient facilities in schools such as libraries, laboratories and lack of qualified chemistry teachers, but also, the poor learning environment for many secondary schools do not support well the implementation of the competency based curriculum. In addition, home based factors such as economy as well as student interests affect the performance

The following are conclusions provided in the light of the specific objectives of the study and findings:

The competence based curriculum, which is very important in the development of natural science subjects like chemistry, is not supported well by the learning environment for most schools. Facility distribution and accessibility in secondary schools together with the problems of enough qualified chemistry teachers in schools remains to be among the major challenges which lead to poor performance in the ZIMSEC examination results. Not only

facility and human personnel oriented problems affect poor performance in secondary schools but also students' home support influence the morale of students studying natural science subjects

5.3 Recommendations

On the basis of the results obtained the following are the key recommendations of the study, there is a need for urgent action on dealing with the issues of poor performances in ZIMSEC examinations. Government and secondary school owners ought to increase the number of science subject teachers, provide adequate teaching and learning materials like laboratories, libraries and textbooks as well as laboratory technician. Teachers should try their best to fulfil their teaching role regardless of the challenges of the teaching environments instead of just complaining. Government, NGOs, school owners, and all community should increase students and public awareness on the importance of natural science subjects for the development of our country.

The issues of poor performing students ought to be given more emphasis on school inspections starting from the inspectors' annual guidelines.

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Appendix A: Questionnaire for students

Dear Student

My name is Tauya Fadzai, a student at Bindura University of Science Education; I'm conducting a study on the factors academic performance of students at ordinary level. This is in partial fulfillment of my degree program in Chemistry education. May you please answer all the questions provided honestly and do not write your name on the paper. Your responses will be kept confidential.

SECTION A

Demographic Information

Please tick in the appropriate circle (✓)

Gender

Male ☐

Female ☐

Age

: Below 11 years ☐

11-13 years ☐

14-16 years ☐

17-19 years ☐

20 + years ☐

Level:

Junior certificate ☐

Ordinary ☐

Advanced ☐

SECTION B

The scale below is assigned with numbers in ascending order from 1 to 5 in accordance with your choice. Numbers used indicate the following levels of your perceptions about a statement shared.

Number	1	2	3	4	5
Meaning (Perception)	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Your choice					

In all statements shared, choose one response representing your perception or understanding about a statement shared by simply putting a tick (✓) in the relevant box provided.

For example, in the question below:

Chemistry is the easiest subject compared to other subjects?

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice			III.		

This reads: I neither agree nor disagree with the fact that Chemistry is the easiest subject compared to other subjects?

PLEASE INDICATE WHAT YOU THINK ABOUT THE FOLLOWING

1. Chemistry is a very difficult subject

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice					

2. I have the topics I enjoy in chemistry.

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice					

3. I have the topics that I do not enjoy in chemistry

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

Scale/ Number	1	2	3	4	5
Your choice					

4. I enjoy chemistry homework? .

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

5. Chemistry teachers makes the topics enjoyable

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

6. Is there any improvements that should be made to enhance your performance?

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

7. I can easily catch up when learning Chemistry through hands on.

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

8. Chemistry is important in my future carrier

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

9. I don't know the importance of chemistry in my future life

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice					

10. Chemistry syllabus is too big, with many content.

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice					

11. The chemistry laboratory has the following facilities chemicals (acids, bases, litmus paper, test tube and beaker.

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice					

choice					
--------	--	--	--	--	--

12. Laboratory has no facilities

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

13. Do you have your own Chemistry books?.

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

14. The school provide Chemistry texts books to students

Percep tion	Stron gly Disagree	D isagree	Unde cided	Agree	Stron gly Agree
Scale/ Number	1	2	3	4	5
Your choice					

15. The school motivates the learners through prizes

Perception	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scale/Number	1	2	3	4	5
Your choice					

Thank you for your cooperation

THANK YOU FOR YOUR TIME AND CONTRIBUTION IN FILLING UP THIS QUESTIONNAIRE. YOUR CONTRIBUTION WILL MAKE THE SUBJECT MORE UNDERSTOOD, FUN AND INTERESTING

APPENDIX B : FOCUSED GROUP DISCUSSION QUESTIONS TO STUDENTS

1. What challenges do you encounter while learning Chemistry?
2. How confident are you in learning Chemistry practical?
3. What could be the reason for poor performance?

APPENDIX C: INTERVIEW QUESTIONS TO TEACHER

SECTION A

Demographic Information

My name is Tauya Fadzai, a student at Bindura University of Science Education; I'm conducting a study on the factors academic performance of students at ordinary level. This is in partial fulfillment of my degree program in Chemistry education. May you please answer all the questions provided honestly and do not write your name on the paper. Your responses will be kept confidential.

Please tick in the appropriate circle (✓)

Gender:

☒ Male

Female ☐

Age:

Below 20 years ☐

20-30 years ☐

31-40 years ☐

40-50years ☐

50 + years ☐

Highest Qualification:

Certificate in Education ☐

Diploma in Education ☐

Bachelor of Education Degree ☐
Degree ☐

Bachelor of Education Honours

Any Other (Specify)

Teaching Experience

Below 5 years ☐

5 to 10 years ☐

10 + years ☐

SECTION B

1. How is the performance of students in Chemistry in comparison with other subjects?
2. What could be the reason for this performance?
3. Which topics do you consider difficult to teach?
4. What makes topics difficult?
6. How do you rate the Chemistry curriculum?
7. How do students participate in class?
8. How do students do their homework?
9. How can the performance be improved?.