

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

DEPARTMENT OF SCIENCE AND MATHEMATICS EDUCATION



**PROPOSAL PROJECT TITLE: RELATIVE EFFECTIVENESS OF PEER TUTORING
STRATEGY IN IMPROVING SECONDARY SCHOOL STUDENT'S ACADEMIC
PERFORMANCE IN CHEMISTRY AT ORDINARY LEVEL IN SEKE DISTRICT.**

BY

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**A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
OF THE DIPLOMA IN SCIENCE EDUCATION (DipScEdChem)**

2024

APPROVAL FORM

The undersigned certify that they supervised, read and recommended to the Bindura University of Science Education for the acceptance of the research project entitled:

Relative effectiveness of peer tutoring strategy in improving secondary school students academic performance in chemistry at ordinary level in Seke District.

Submitted by Fadzai Mikili

In partial fulfillment of the requirements of the Diploma in Science Education (Chemistry)

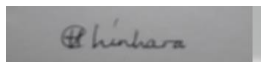
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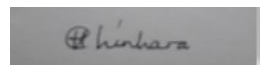
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DECLARATION

I, Mikili Fadzai do hereby declare that this project is my own work and the information that I used from the published or unpublished sources have been acknowledged in text and also on the reference list. This project has not been previously submitted at the Bindura University of Science Education or at any other university and it is therefore submitted in the partial fulfillment of the requirement of the Diploma in Science Education at Bindura University.

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RELEASE FORM

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Relative effectiveness of peer tutoring strategy in improving secondary school students' academic performance in chemistry at ordinary level in Seke District.

DIPLOMA TITLE : Diploma in Science Education (Chemistry)

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ABSTRACT

This study explores the relative effectiveness of peer tutoring strategy in improving secondary school students' academic performance in chemistry at ordinary level in Seke District. This research identified the benefits of a peer tutoring strategy in improving students' performance in chemistry, determine the students and teachers' perceptions towards peer tutoring strategy, establish the prevalent challenges faced by secondary school teachers in applying peer tutoring strategy as well as determining the strategies implemented in curbing challenges faced by secondary school teachers in applying peer tutoring strategy. A case study of one school in Seke District was used for the research through a case study approach, with data collected through questionnaires and interviews. The study established that peer tutoring strategy is a powerful teaching method that can influence teaching and learning process in secondary schools. Peer tutoring strategy proved to be beneficial to both teachers and students in the process of teaching and learning. Study findings also revealed that peer tutoring assists in sharing of information, working in a collaborative way and learning in an autonomous way which indicated that a general agreement that peer tutoring helps the students in their tasks to work together. Peer tutoring use in the teaching and learning also positively impacts on students in the teaching and learning process. Peer tutoring generate three significant milestones: access to teaching and learning chances; cultivating the quality of learning and teaching; and distributing oneness amongst students. The study recommends teachers and students to have positive attitude on the use of peer tutoring strategy in the process of teaching and learning. The ministry of Primary and Secondary Education should provide the equipment in schools because school are failing to provide adequate peer tutoring that can be used in the process of teaching and learning process. Teachers and learners should be trained on how to use peer tutoring in the process of teaching and learning. Governments should improve the training of HOD's, teachers and students on the use of computers and other ICT equipment which can assist in peer tutoring through seminars, workshops and in-service training.

DEDICATION

I dedicate this project to Almighty God, who has guided and strengthened me throughout my academic journey. I also dedicate this work to my beloved family, who have been my rock and support. Your encouragement, patience, support and understanding have meant the world to me and kept me going. Your sacrifices and belief in me have fueled my determination to succeed. This achievement is not only mine but for everyone who stood by me. May God bless and prosper us all.

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CHAPTER ONE

1.0 INTRODUCTION

It is undeniable that elevation of student performance is highly dependent on vast factors. One of the paramount factors is teaching and learning strategies used by the teachers. The gist of this study is to investigate the relative effectiveness of peer tutoring strategy in improving secondary school students' academic performance in chemistry in Seke district. This write-up discusses the background to the study, statement of the problem, research objectives, research questions, purpose of the study, significance of the study, delimitations, limitations, definition of key terms and abbreviations. The chapter ends with a summary.

BACKGROUND OF STUDY

Performance in chemistry depends largely on effective teaching and learning processes (UNESCO, 2019). Developmental learning theorists brought to education the idea that teachers can be more effective if they can organize learning in a step-by-step manner and connect it to the learner's prior knowledge and experiences (Piaget, 1953). The activities selected in the teaching and learning of Chemistry must nurture plenty of student activity and acquisition of learning skills and that an enabling environment should be created to give the learner the opportunity to interact freely with fellow learners. For effective acquisition of Science and mathematics skills, teachers are advised to use heuristic methods as much as possible so as to involve the learners and keep them interested in the subject. They should have a free hand to use their own approaches (KIE, 2016).

Due to curriculum dynamics and more emphasis on hands-on or practical-based teaching and learning activities around the world, many schools are shifting more to learner-centered

approaches. The study of Goodlad and Hirst (2020) suggests that there is a benefit in switching from the traditional teacher-centered classroom setting to a learner-centered classroom setting which promotes communication. It also suggested that group learning can be a useful tool academically and a classroom management strategy. It could contribute not only to an implementation of new educational policies and to a better understanding of the subject material but also to the enhancement of student interest, motivation, creativity, understanding and equality. Peer tutoring strategy has been researched as an effective strategy to engage students and promote academic success. It improves Chemistry performance for students at risk or experiencing chemistry disabilities (Lazarus, 2018). Findings of 65 independent evaluations of school tutoring programs showed that tutored students outperformed many students in examinations, developed positive attitudes towards the subject matter and gained better understanding of the subject (Cohen et al, 1982). Vassay (2017) conducted a study of peer teaching in Secondary schools and found that it greatly affects the intellectual and moral values of the students such as the ability to express their ideas, mastery of different concepts, time management, and sense of responsibility, sharing, self-discipline, self-reliance, self-confidence, resourcefulness, cooperation and obedience.

Peer-tutoring is a model of mentoring that can assist teachers who have multi-aged and special education students heterogeneously grouped in their subjects. According to the Special Education Guide (2019) proponents of inclusion cite enhanced social interaction as a big benefit for students of all levels of ability because friendships that might otherwise be unimaginable can form and these bonds often allow pupil to understand diversity at a deeper level.

STATEMENT OF THE PROBLEM

The revised curriculum for Primary and secondary schools stipulates that it is essential for schools to dwell much on learners centered approaches in evaluation and assessment so as to enhance content mastery among learners and development of life skills. However, most teachers may not be familiar with assessment frames in this paradigm. This study explores how peer tutoring, as one example of authentic assessment, can be used with 'O' level science classes to improve learner engagement.

PURPOSE OF THE STUDY

The purpose of this study is to determine to what extent peer tutoring can improve secondary school student's academic performance in chemistry.

1.4 MAIN RESEARCH QUESTION

How can teachers improve peer tutoring to teach Chemistry at O level?

1.5 SUB-RESEARCH QUESTIONS

1. What are the benefits of a peer tutoring strategy in improving students' performance in chemistry?
2. What are the students and teachers' perceptions towards peer tutoring strategy?
3. What are the challenges faced by secondary school teachers in applying peer tutoring strategy?
4. What are strategies implemented in curbing challenges faced by secondary school teachers in applying peer tutoring strategy?

1.6 SIGNIFICANCE OF THE STUDY

This study explains the significance of the research to Science teachers, learners and other interested parties such as Ministry of Primary and Secondary Education and to the researcher herself.

1.6.1 Significance to teachers

This research is meant to remind Chemistry teachers in Seke District to apply different teaching and learning strategies which involve student's engagement in their daily teaching and learning processes so as to improve student academic performance in chemistry. Provision of training to teachers to enhance their teaching and learning skills

1.6.2 Significance to students

Peer teaching strategy embracement as a teaching method can help improvement of students feeling of success and to help them develop confidence in Chemistry subject through their direct involvement.

1.6.3 Significance to the researcher

This study will be a benefit to the researcher since the study is carried out in particular fulfilment of the requirements of the programme. The researcher will benefit from attaining the degree programme in Education and also to acquire skills that can be used to carry out professional duties as well as in pursuing other academic studies.

1.7. DELIMITATIONS

The study of relative effectiveness of peer tutoring strategy in improving secondary school student's academic performance in chemistry is to be carried out targeting six secondary schools in Seke district.

1.8 LIMITATIONS

The research might face challenges such as restrictions including time, adequate funds, and lack of co-operation from participants due to pandemic Covid 19. Inadequate finance might lead the researcher into failing to administer information gathering tools such as questionnaires to all chemistry students, teachers and head teacher. Time and finance also might not allow accomplishment of the research on a wider scale.

1.9 DEFINITION OF KEY TERMS

Peer-tutoring as a “teaching strategy in which the class is organized in pairs of two students that may be of different abilities to act as tutor and tutee in the learning process [in order to] get maximum benefits from each other”

Academic performance: is the act of performing, carrying into execution or action under a certain study

Chemistry: is a branch of natural science that deals with the composition and composition of substances and the changes that they undergo as a consequence of alterations in the constitution of their molecules

1.10 ORGANISATION OF THE STUDY

Chapter One deals with the introduction and background to the study.

Chapter two

It provides the theoretical and conceptual framework of the study. Chapter two includes a discussion of the significant literature on relative effectiveness of peer tutoring strategy in improving secondary school student's academic performance in chemistry. It will review other researches conducted by other scholars in relation to this study.

Chapter three presents the research methodology that was used in the study. Which research methodology was adopted for the study? Which issues are covered in this chapter?

In the **fourth chapter**, the researcher presents, analyses and discusses the findings of the study. Which method/s of data analysis and presentation were adopted for the study.

The **fifth chapter** presents the summary, conclusions and recommendations of the study on an relative effectiveness of peer tutoring strategy in improving secondary school student's academic performance in chemistry in Seke district in Zimbabwe.

1.11. CONCLUSION

There researcher has highlighted the five chapters of the research, given a background of the study and identified the research problem. From the aim, objectives and research questions, the researcher identified limitations of the study. The study will shed light on the importance of the study not only to the researcher but also to the teachers and ministry of primary and secondary education.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter will focus on the related literature. This chapter will also reveal the views of different researchers and authorities say about similar research problem. It wants to discover what different authorities and researchers found on relative effectiveness of peer tutoring strategy in improving secondary school student's academic performance in chemistry. The research will chiefly review on theoretical framework, concept of peer tutoring, types of peer tutoring, importance of peer tutoring, relevance of peer tutoring to the current curriculum and students and teachers' perception on peer teaching strategy. A conclusion is going to be drawn at end.

2.2 Theoretical framework

This research is chiefly guided by Vygotsky theory of Zone of Proximity Development (ZPD) . The paramount aspect of Vygotsky's theory is the idea that the potential for cognitive development is limited to a "zone of proximal development" (ZPD). This "zone" is the area of exploration for which the student is cognitively prepared, but requires help and social interaction to fully develop (Briner, 1999). A teacher or more experienced peer is able to provide the learner with "scaffolding" to support the student's evolving understanding of knowledge domains or

development of complex skills. Collaborative learning, discourse, modelling, and scaffolding are strategies for supporting the intellectual knowledge and skills of learners and facilitating intentional learning.

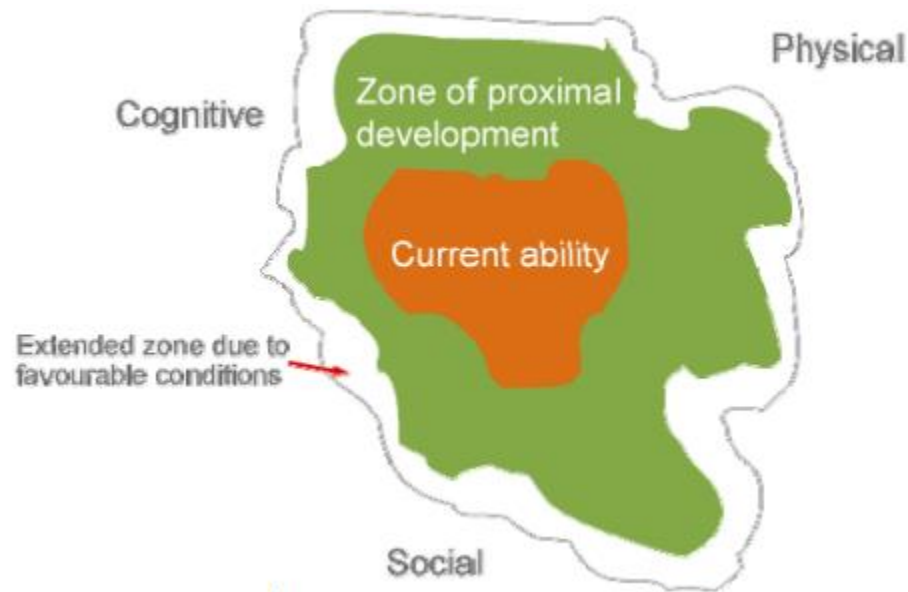


Figure 2.1 Vygotsky theory of Zone of Proximity Development (ZPD)

Vygotsky developed the Theory based on the active involvement of peers, adults, and teachers in the learning process. Specifically, Vygotsky believed advanced or more knowledgeable peers, teachers, or other adults greatly aided the learner in the construction of knowledge. Adults or peers, with a greater degree of knowledge, are capable of assisting and directing the learner in such a way as to promote a learning dialogue (O'Donnell & O'Kelly, 2015). As the learner engages with more knowledgeable individuals, the learner is able to begin the process of co-construction of knowledge. Co-construction was defined by Woolfolk (2011, p. 44) as, "A social process in which people interact and negotiate (usually verbally) to create an understanding or to solve a problem." During the co-construction of knowledge, the learner is able to acquire the skills and confidence necessary to begin the process of concept mastery (Woolfolk, 2011).

Furthermore, Vygotsky believed learning could occur at a greater rate when individuals were challenged by a more knowledgeable or capable individual (Hogan & Tudge, 2017). Most often, this more knowledgeable individual is embodied in the role of adults or teachers; however, peers, if they hold a higher degree of subject knowledge, are able to assume the role of the more capable individual. Vygotsky's theory emphasized the role of peers as knowledge providers, yet held at its foundation the sociocultural view that learning could not be removed from the social context (De Lisi & Golbeck, (2014). Hogan and Tudge (2017) stated that while Vygotsky's theory emphasized more child-parent/teacher interaction, Vygotsky's theory also, “. . . has tremendous implications for our understanding of peer collaboration” (p. 40).

2.3 Concept of peer tutoring

Peer learning in its broadest sense is seen as students learning from and with each other, in both formal and informal ways. It is an instructional strategy in which groups of children under the guidance of the teacher work together through a given instructional assignment with brilliant child, the peer teacher; providing assistance and instruction to others. It is a student-centred approach and a total shift from the teacher-centred or lecture method of teaching. The emphasis is on the learning process, including the emotional support that learners offer each other, as much as the learning tasks itself. In peer teaching the roles of teacher and learner are fixed, whereas in peer learning they are either undefined or may shift during the course of the learning experience. The proposal points to the child's ability to profit from interaction with more competent peers. It is important to consider who the “peer” in peer learning is. Generally, peers are other people in a similar situation to each other who do not have a role in that situation as teacher or expert practitioner. They may have considerable experience and expertise or they may have relatively

little. They share the study as follows learners and they are accepted as such. Most importantly, they do not have power over each other by virtue of their position or responsibilities.

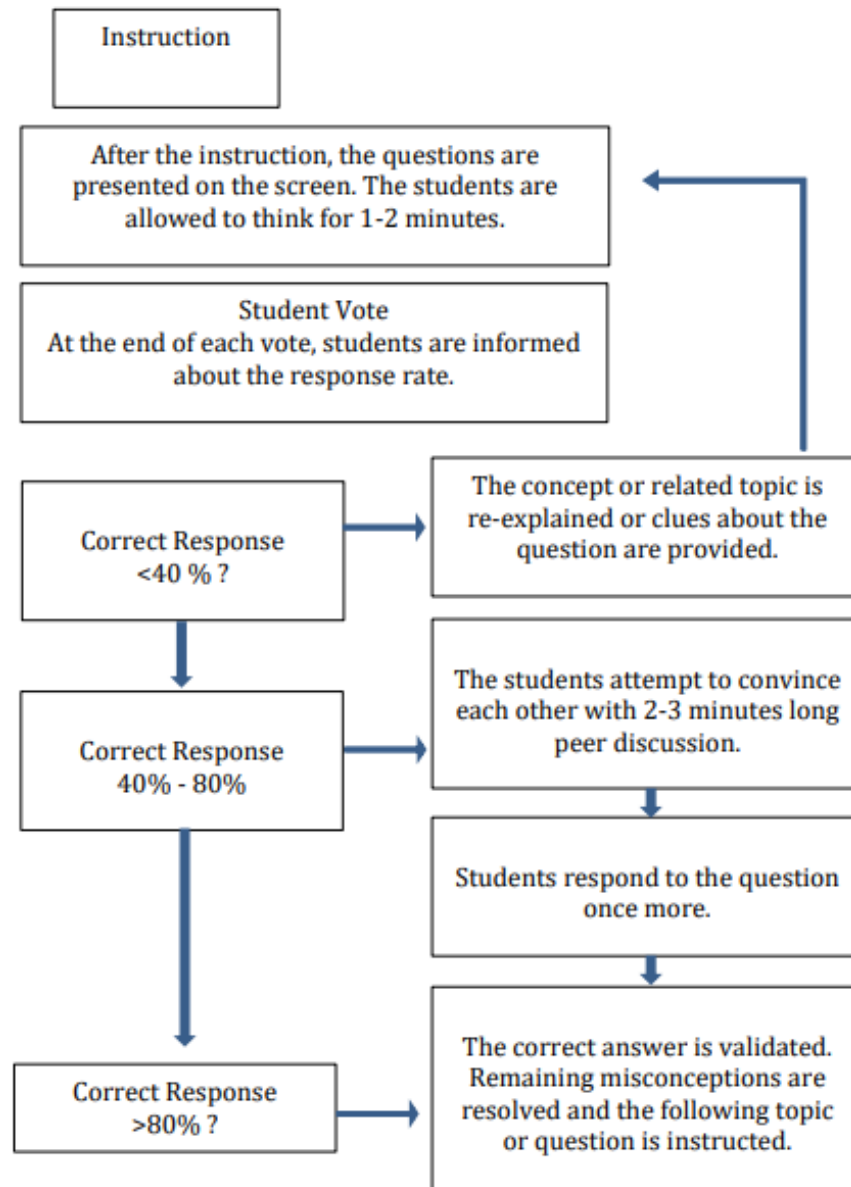


Figure 2.2 Peer tutoring instructional format

More so, peer tutoring is a systematic, peer mediated teaching strategy. Peer – tutoring involves students’ learning from and with each other in ways which are mutually beneficial and involve

sharing knowledge ideas and experiences among participants (Boud, Cohn & Sampson, 2001; Rohrbeck, Ginsburg – Block, Fantuzzo & Miller, 2003). In Peer tutoring or peer-mediated arrangement students work together in pairs or groups to practice academic skills and provide each other with immediate feedback. It is a highly structured teaching arrangement that can supplement and strengthen the effectiveness of balanced literacy programs. The pairs of students can be of the same or differing ability and/or age range. Moreneo and Duran (2002) describe peer tutoring as a method of cooperative learning based on the creation of pairs of students with a lopsided relationship; that is, the tutor and tutee do not have equal academic ability but they share a common goal. This goal must be achieved through a relationship framework organised by the teacher. Peer tutoring is regarded as an excellent resource for facilitating the mastery of interpersonal competencies. Fuchs, Fuchs, Mathes, and Martinez (2002) assert that socialisation experiences that occur during peer tutoring can benefit both the tutor and the tutee by encouraging students to learn and increase their social standing among peers. Peer tutoring was found to be helpful in socialisation experience as the level of interaction among students both inside and outside the classroom improved significantly.

2.4 Two types of peer tutoring

There are mainly two types of peer tutoring namely incidental peer tutoring (IPT) and structured peer tutoring (SPT). Incidental peer tutoring often takes place, either at school or while students are playing after school or when they are socializing. Structured peer tutoring, on the other hand, refers to peer tutoring implemented in specific cases and for specific subjects, following a well-structured plan prepared by the teacher

2.5 Importance of peer tutoring

According to with respect to student dynamics, peer learning strategies foster student relationships and help students develop a greater multicultural understanding and acceptance. When students are put into groups where they can talk freely, they can bring in aspects of their background and beliefs, potentially leading to more understanding among the members of a group. Students also learn to interact with a group of people that they may not generally work with and can engage in conversation even if it is outside of their comfort zone. It is regarded as very important for various reasons which include motivation, concept learning, manipulative abilities, enquiry skills and the development of appropriate scientific attitudes (Hawau, 2017)

A research conducted by Crossgrove & Curran, (2008) suggested that in the strategy, breaking large lectures into smaller groups in which peer instructors facilitate cooperative group work dramatically increases the interactive engagement of students. Peer-led learning has three major advantages over teacher-directed learning because:

- 1.0 The large content specific cognitive gaps between teachers and students which limit students' abilities to generate knowledge is removed;
- 2.0 Peers are closer to the students' zone of proximal development, the region of students' potential knowledge gain, and they can therefore communicate and facilitate learning through channels not available to the teacher;
- 3.0 Peer leaders enrich the overall flow of information within the course as they interpret the teacher's expectations and presentations to the students and also explain students' responses and potential misconceptions to teacher (Prezler, 2009).

Peer tutoring is also important for the tutor; that is, learning is encouraged through teaching. Hartman (2010) conducted an evaluation study and reported that peer tutoring increased

students' motivation to learn. This result is supported by Whitman (2012) and Annis (2013) who argue that peer tutoring can be the most intellectually rewarding experience of a student's career. They found peer tutoring helped students perform better on higher order conceptual understanding scales than students who read the material simply for study purposes. Topping (2010) also asserts that peer tutoring serves as an effective way to improve self-esteem in students. Peer tutoring aids interaction among peers not only academically but also socially.

2.6 Relevance of peer tutoring to the current curriculum

The recommended instructional approach for curriculum implementation is a guided discovery approach resting on student activity to enable learners to appreciate science as a process (FME, 2009). This is to ensure that learners are provided with continuous experience in skills of defining problems, recognizing assumptions, critical thinking, hypothesizing, observing collecting and recording data among other skills. The curriculum further states that some schools may be constrained by ill equipped laboratories, lack of qualified teacher and large classes, nevertheless, it is suggested that, the constraints notwithstanding, where this curriculum is used, the basic element of Chemistry as an experimental science must not be compromised (Ogunleye, 2002; Inyang, 2006; FME, 2009). This underscores the importance of practical activities in science learning (Muhammad, 2013) However, Chemistry instruction has remained primarily didactic, dogmatic, teacher and textbook centered, leaving little or no room for such idiosyncrasies suggested in the Curriculum and in line with the ideals of Constructivism (Adamu, 2000; Ogunleye, 2002). The current inadequacies in the status of Chemistry teaching has led to poor student achievement in the subject in recent years. This has manifested in the poor performance of students in Chemistry in Secondary Schools (Ogunleye, 2011).

2.7 Students and teacher perception on peer teaching strategy

According to the research conducted by Agezo, (2015) his study revealed that teachers and students have perceived peer-led learning positively. In spite of their good perceptions, their practices of peer-led learning were low. The opportunities to strengthen peer-led learning were teachers' and students' positive perceptions and distribution of check lists in the school. To conclude, school teachers and students have positive perceptions and low practices of peer-led learning. There is no significant difference in their perceptions. Based on the major findings, the researcher recommended minimizing problems encountered and maximizing the implementation of peer-led learning. The result of this study showed that teachers and students have significantly similar positive perceptions about peer-led learning in the school.

Similarly, the study is in line with other studies which were done by Cracolie and Trautman (2011) in cooperative learning that deals with small groups of students, their achievement and perceptions. According to this study, teachers and students suggest that peer-leaders and other students should provide the social support to foster learning. The result of the study indicated that both teachers and students have a positive attitude towards the existence of peer led learning methods in the school.

According to the findings of Foot and Howe (2013), research investigation on collaborative learning shows that group members work together and acquire knowledge through their struggle to maintain equilibrium, a process involving the reconciliation of conflict between new and previously owned beliefs. Hence, the finding of the research indicated that the perceptions of

peer-led members regarding peer-led learning methods depended on their previous academic background.

2.8 How learners are organised during peer tutoring

The variation of creative dialogue used by Tighe required that the teacher write questions on the blackboard and instruct students to organize into groups of five or six after the teacher removes himself (or herself) from the classroom. When the teacher leaves, each group selects a spokesperson to record the group's observations and questions and begins discussion. After an hour, the teacher returns and the spokespersons make brief reports. Tighe emphasizes the social process of learning that Bruffee discussed in his essays (2000).

Real learning ... is not a solitary task. One person cannot be expected to discover five different interpretations of a piece of literature. But five people can. It is where the real dialogue begins- each student can examine his ideas in relationship to those of his peer group (Tighe 2014).
Learning activities that can be assessed through peer teaching in chemistry

2.9 Chapter Summary

This section showed literature review of other scholars chiefly focusing on theoretical framework, concept of peer tutoring, types of peer tutoring, importance of peer tutoring, relevance of peer tutoring to the current curriculum, students' and teacher perception on peer teaching strategy and how learners are organised during peer tutoring. The following chapter is going to show the research methodology which was used in this research.

CHAPTER THREE:

RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter focuses on the whole research methodology. It analyses the research design, instrument used and data collection procedures that followed and the explanations for their merits and demerits. The data collection, presentation and the analysis plans will also be looked at. The study will use the descriptive survey as its research design. In this research study the researcher will employ the descriptive survey is the most suitable design since it looks on relative effectiveness of peer tutoring strategy in improving secondary school student's academic performance in chemistry at Jonasi High School in Seke district.

3.2. RESEARCH PARADIGM

Cooper and Schindler, (2016) noted that research paradigm deals with the source, nature and development of knowledge. In simple terms, a research paradigm is belief about the ways in which data about a phenomenon should be collected, analysed and used. The researcher is to collect data by employing questionnaire and interviews for the study. The researcher is to employ descriptive statistics to analyze the quantitative data. Descriptive statistics are mathematical and graphical techniques used to organise or summarised a set of numerical data (Gall and Borg, 2017). The researcher would apply percentages to indicate the frequency of various responses expressed by the respondents. The researcher will arrange the quantitative data

in tables. Qualitative data will be coded and then analysed using identified themes. Although the idea of knowledge creation may appear to be profound as the researcher will be engaged in knowledge creation as part of completing her dissertation. She will collect secondary and primary data and engage in data analysis to answer the research question and this answer marks the creation of new knowledge.

3.3. RESEARCH DESIGN

A research design is the scheme, outline or plan that is used to generate research problem (Orodho, 2018). This study dealt with both quantitative and qualitative data. Neither quantitative nor qualitative research is entirely perfect for research, therefore triangulating between both these approaches should give the best results as each covers for the weaknesses of the other (Denzin, 2019). Descriptive survey design will be used to collect data from respondents. This approach gives the researcher an opportunity to gather factual information necessary for decision making. Also the researcher identifies the opinions, feelings and practices of the subjects through discussion (Gay and Airasian, 2015). This method was employed since the study was out to seek opinions and facts from the target population. Thus, questionnaires will be used to elicit information from respondents within the descriptive survey study.

3.4. POPULATION

Polit and Hungler (2015) refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. In this study the population constitute of students, teachers and HODs. The researcher used a population of 25 respondents. This constitute students, teachers and HODs at Jonasi High School in Seke district School.

3.5 SAMPLE AND SAMPLING PROCEDURES

According to Masuku (2019) a sample group of the population whose responses can be said to represent the pattern of responses in the whole population. Cohen and Manion (2017) define purposive sampling as a form of convenience sampling in which population elements are selected based on the judgment, experiences and prior knowledge of the researcher which she exerts in choosing the participation she believes are true representatives of the entire population. The researcher used purposive sampling method. Kumar (2014) defines purposive sampling as a non-probability sampling method in which selection of sample units depends on discretion or judgment of the researcher. It is a small group of people chosen from the population whose views be generalized on the whole population. In a research study, especially for academic purposes, it is practically impossible to work with a whole population. If information collected a whole population, it will be too voluminous to read through and analyse thoroughly. A lot of time will be spent in the task of data collection and analysis, is unnecessary. A whole population is very difficult, if possible at all to access. Again, a researcher will need a lot of financial resources for travel expenses and preparation of materials if she is to work with the whole population. For these reasons, it is therefore, imperative for a researcher to choose a few people from the population with whom to work. The responses of those few will be considered to be representatives of the whole population.

In the study, the sample size was comprised forty-five learners, two teachers and the head teacher at the school were chosen as respondents in the study through purposive means. Brynard and Hanekom (2016) explained that, in purposive sampling the selection of the sample elements is done deliberately and subjectively so as to be representative of the total population.

In essence, purposive selection entailed the actual visit to the area, meet with the targeted participants and negotiate their involvement and inclusion through a consent letter. The targeted

participants were selected because they were in the targeted area of Seke District. Hence, purposive sampling was chosen for its ability to choose data rich respondents, knowledgeable. Furthermore, purposive sampling was chosen for its ability to rely on the researchers' background information on respondents, objectives to be covered in selection of the key informants (Creswell, 2012).

3.6 INSTRUMENTS

The researcher is going to use questionnaire, interview guide and focus groups to collect data for the study. Masuku (2013) cited that the method one chooses to collect his/her data normally depends on the nature one wants to collect. Research instruments can be defined as methods which the data for the research is collected. In other words, these are all the techniques and strategies employed for capturing data. In this research study, the researcher used three research instruments. In this research, the researcher viewed these instruments to be the most effective research instruments in data collection. According to Leedy (2017) a research instruments is something used to observe data beyond the physical reach of the observer. The researcher, due to limited time only used the questionnaires and interviews as the research instruments. The researcher chose the questionnaire and interviews as tools for gathering data because they provide a means of discovering prevailing attitudes among a large population. According to Good and Sales (2014) a questionnaire is prepared and distributed to secure responses to certain questions. Tuckman (2015) defines a questionnaire as a document containing questions designed to solicit information appropriate for analysis. Leedy (2018) adds on by saying that questionnaires dig information buried within people's minds, attitudes and feelings. Since communication involves feelings, behaviour, attitudes, practices and conditions, the questionnaire, interview and focus groups were the most appropriate tools for collecting data for

this research.

3.6.1 QUESTIONNAIRE

The study used primary data which was obtained through questionnaires. The research instruments used in this study were structured questionnaires and interviews. According to Kombo and Tromp (2016) a questionnaire is research instrument that gathers data over a large sample. The questionnaire is simple, easy to administer and well laid out for easy analysis and it proves to have the ability to collect large volumes of data (Saunders, 2008). Marasu (2000) adds that in the case where wide coverage is required, a questionnaire is the most effective instrument to collect data, and that respondents are free to give information as they remain anonymous. The little skill required administering a questionnaire and the instrument saves time since there is scope for simultaneous administration of the instrument. However, questionnaires have disadvantages in that response rate can be low and no clear reason can be given for incomplete responses. Document analysis refers to the collection, review interrogation and analysis of documents which in this study are admission register and class attendance register.

3.6.2 SEMI-STRUCTURED INTERVIEWS

Interviews are methods of maintaining and generating conversations with people on a specific topic or range of topics to enable social researchers to interpret the resultant data (May, 2011). They involve direct personal contact with the participants who are asked to answer questions relating to the research problem (Bless & Higson-Smith, 2000). The researcher interviewed the students in order to acquire deeper insight of study. Knight (2019), argues that an interview is a direct face-to-face attempt to obtain reliable and valid measures in the form of verbal responses from one or more respondents. Semi-structured interviews enabled the researcher to get immediate feedback from participants hence achieved a high response rate (Chiromo, 2009). In

addition, interviews were quick to conduct which allowed the interviews to take place within a short time and enabled the researcher to use them on a relatively large sample (Cohen & Manion, 2011). Data generated using semi-structured interviews were easily quantified. The researcher could adjust the sequence of questions and probe further to get clarification and in-depth data when she used semi structured interviews. This was useful in obtaining detailed information about personal feelings, perceptions and opinions. Thus, the researcher got a comprehensive understanding of issues discussed. Interviews also enabled the generation of primary data (Chiromo, 2009).

To ensure validity of the interviews the researcher consulted the respondents on a suitable venue and convenient time for the interview to make sure that the respondents are comfortable to open. The researcher also made appointments with the respondents so that the respondents get ready for the interview. Cohen and Manion (2011) argue that appointments ensure that there is no embarrassment on the part of the interviewer and interviewee. However, interviews have got their disadvantages which are that unstructured interviews often yield data which maybe too difficult to recapitulate or evaluate but the weaknesses of the interviews will then be addressed by other tools.

3.7 TRUSTWORTHINESS AND AUTHENTICITY

3.7.1 RELIABILITY

Reliability of an instrument is a measure of how consistent the instrument is in its measurements. The reliability and the appropriateness of the instruments are to be tested in the pilot study for internal consistency and stability. Therefore, a test-retest is done by administering the same test twice to the same group after two weeks had elapsed after the first test. A reliability coefficient

was then calculated to indicate the relationships between the two sets of scores obtained. The scores in the first test were used with those of the re-test.

Data reliability will also be ensured by correct identification of respondents to be included in the study, dealing with subject error (knowing the time to carry the surveys and interviews) and subject bias (taking elaborate steps to ensure anonymity of respondents to questionnaires (Newman, 1997). The researcher will also use methodology triangulation (Denzin, 1970), which is a combination of the different methods to strengthen the study since each method has its own strengths and weaknesses. Using more than one technique therefore offsets possible weaknesses of using one method. Questionnaires will thus be complimented with observation

3.8 DATA COLLECTION PROCEDURES

Descriptive statistics were used to analyse the quantitative data. Descriptive statistics are mathematical and graphical techniques used to organise or summarised a set of numerical data (Gall and Borg, 2017). The researcher used percentages to indicate the frequency of various responses expressed by the respondents. The researcher arranged the quantitative data in tables and graphs. Qualitative data were coded and then analysed using identified themes. Categories and themes were created in order to identify patterns in the data (Hamunyela, 2008). Analysis of the qualitative data also included searching for relationships and patterns to get a holistic picture on relative effectiveness of peer tutoring strategy in improving secondary school student's academic performance in chemistry at Jonasi High School in Seke district. After all the data from questionnaires, focus group and interviews has been collected, the next step is to analyse the data. In this case, the study is guided by hypothesis, so the researcher will use the deductive technique of data analysis. Data will be analysed to find out if there are any recurrent features in

the responses. The recurrent features will be used either to confirm or to refute claims in the hypothesis. Conclusions will be drawn from the analysis of the data

3.9 DATA PRESENTATION AND ANALYSIS PROCEDURES

Tables and graphs will be used to present the gathered data. Data should be presented in description form this means telling the events as they happen (Best and Khan, 2018). Tables and graphs are also being used to aid improved clearness, and to allow understanding of the information at a quick look (Best and Khan, 2018). After gathering data, the data is presented linking it with the research questions. The answers from the participants are critically analysed so as to fully take to meaning each item on the questionnaire and interviews. The collected data is analysed to get results and recommendations quantitatively.

3.10 ETHICAL CONSIDERATIONS

Saunders et al (2019) refer to ethics as the appropriateness of the researchers' behaviour in relation to the rights of those who become the subject of your work or are affected by it. The general issues of ethical concerns will be addressed through notification of the intention to conduct the study to the respondents; seeking consent from all participants such as the students; and non-disclosure of identities to ensure privacy. Ethical issues refer to conducting research in a manner that does not result in harming the participants in one way or the other. Sapsford and Jupp (2016) explain an ethical act as "doing no harm" obtains the participants'. The purpose of the study was explained to the participants and they were notified of how the information would be used. During the data collection process, the interviewees were informed of their right.

3.11 SUMMARY

In this chapter, the research design to be used in the study has been outlined, that is the descriptive research design. It defined the research approaches as well as the research instruments used. Ethical considerations were also looked at. The research population was described, that is students. It was explained that a sample of seventy was possessively selected from the population. From that sample, data was collected by way of questionnaires and interviews. The next chapter is on presentation, interpretation and analysis of results.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter focuses on data analysis, presentation and discussion. The research was to find the effectiveness of peer tutoring and questionnaires, interview guide and focus group were used. Data can be presented in different ways such as pie charts, bar graphs and tables. The data which was collected using the above research instruments which will be analysed and presented using different types of data presentation. Tables will be used to present the data.

4.2 Research Findings

The next section will focus on biographical data of the findings from the research.

SECTION A

4.3 BIOGRAPHICAL DATA

The researcher used interview guides, questionnaires and focus groups to collect data. The data will be presented using tables.

The table below shows the data that was collected from one HOD of a Secondary School in Seke District.

G e n d e r	A g e	Professional qualifications	E x p e r i e n c e
M a l e	4 1 - 4 5	Master's Degree	6 - 1 0 y e a r s

The table shows that the HOD has more experience of 6-10 years and holds a Master's Degree and is aged between the age of 41-45 years. According to O'Donnell and O'Kelly, 2015, states that a teacher with a greater degree of knowledge, is capable of assisting and directing the learner in such a way so as to promote a learning dialogue. School Heads of Department with teaching experience can provide experienced leadership to the chemistry department, helping to guide the teachers and support their professional development.

4.3.1 ANALYSIS OF DATA FOR TEACHERS

Number of respondents	G e n d e r	A g e	Professional qualifications	E x p e r i e n c e
1	F e m a l e	25-30	Bachelor's Degree	1 - 5
2	m a l e	31-35	D i p l o m a	1 - 5
3	f e m a l e	41-45	Bachelor's Degree	1 - 5
4	f e m a l e	31-35	D i p l o m a	1 - 5

From the above table the questionnaire was used to collect data. It shows that there are more female teachers than male teachers. There are 3 female teachers and 1 male teachers. All the teachers have a 1-5-year experience. On professional qualifications, it shows that 2 teachers, who are both females obtained a Bachelor's Degree in Education. One male and one female both attained a Diploma in Education. From this data it shows that all the teachers are qualified to teach chemistry at ordinary level.

According to the interpreted data, it shows that the teachers lack enough experience. Teachers with a greater degree of knowledge are capable of assisting and directing the learner in such a way to promote a learning dialogue (O'Donnell and O'Kelly 2015). This simply means that a teacher with more experience is capable of assisting the learners to their full potential.

The next section will focus on the results that were obtained from the research.

SECTION B

4.4 PARTICIPANTS PERCEPTION IN THE USE OF PEER TUTORING STRATEGY.

3) How does peer tutoring help learners understand the concepts taught when learning chemistry?

This section focuses on how teachers improve peer tutoring in teaching and learning of chemistry. Below are the responses from the participants on the questions as informed by the sub themes.

MOTIVATION

The participants suggested that the biggest role of peer tutoring is motivation. All participants indicated there was more excitement as learners shared important concepts and also lead each other in teaching and learning. Below are their responses.

Teacher 1 emphasized, *"Yes, peer tutoring improves the teaching and learning process. It plays a big role in motivating learners in their learning, this in turn motivates the teacher in his/her teaching process."* Also another teacher pointed out how peer tutoring motivates learners. Teacher 2 said, *"Peer tutoring allows learners to be more involved in their learning. This increases their participation and concentration."* This was in support according to Hartman (2010) he conducted an elevation study and reported that peer tutoring increased students' motivation to learn. The researcher also found out that the learners felt more motivated during their learning. Focus group A said, *"Peer tutoring makes us to be more actively involved in our learning process. The strategies that are used by our teachers motivates us and push us to be eager to learn more."* Another learner from focus group D said, *"Personally peer tutoring motivates me and I become more participative during lessons. This allows me to be more independent in my learning of chemistry. I am now able to raise up my hand and speak my answer and even at times not hesitate to do presentations in front. Peer tutoring has also built me confidence since I used to have 'stage fright'."* This result is supported by Whitman (2012) & Annis (2013) who argue that peer tutoring can be the most intellectually rewarding experience

of a student's career. According to this research it shows that peer tutoring plays a role in the motivation of learners during their learning process of chemistry.

The next theme is on how peer tutoring assists in the participation of the learners.

PARTICIPATION

According to the findings of the study participants emphasized on how peer tutoring assisted them in their participation during lessons. The study also reviewed that learners became more enthusiastic when the lessons are being conducted. The following are responses from the research. *"It makes us to be more actively involved in our learning. As students we are able to pay attention and able to present our answers and also ask questions where we have not understood. Peer tutoring has boosted our confidence in our abilities to teach and assist other learners,"* said focus group A. According to Bruffee (2000) peer tutoring improves the learner participation. He stressed that peers engage in discussions or debates without the teachers' interference. This allows each learner to be able to give their own point of view and opinions. It gives them a chance to be confident and participative. A student from focus group D said *"During peer tutoring lessons, I become more actively involved in the learning process. I enjoy explaining the concepts we would have learnt to others as this in turn helps me to retain information fast and also able to remember all we would have learnt."* The participants especially the learners suggested that every learner should have a chance to be a peer tutor. They said that this helps to build their confidence and improve their participation. One learner said *"During lessons every one of us should be given a chance to be a tutor. Whether you are a fast or slow learner, below or above average everyone should be given a chance. This actually motivates us, builds our confidence and makes us feel we belong, that we are part of the group."* Velez et al (2011) said that learners feel a sense of belonging when they are all peers, a warm and welcoming atmosphere is created whenever they are peers. Students will be able to cooperate on their own language. From this study it shows that peer tutoring improves learners' participation during lessons.

The next theme is on collaborative work

COLLABORATIVE WORK

The study is in line with the studies that were done by Cracolie and Trautman (2011) in collaborative learning that deals with small groups of students and their achievement. The results of this study indicated that some teachers and students both provide a social support that fosters learning and teaching. A student from focus group E supported this point by saying *"Peer teaching allows us to be more independent of the teacher as we will be learning as peers only. The biggest help that we get is collaborative working which allows us to work as a team and have oneness between us. We will be challenging each other and not competing with one*

another. It also builds our communication skills." This shows that peer learning assists learners be able to work as a group and understand each other and coming up with a single conclusion as a group. According to the findings of Foot and Howe (2013) research investigation on collaborative learning shows that's group members work together and acquire knowledge through their struggle to maintain equilibrium. According to Teacher 4 saying, *"Peer tutoring allows learners to concentrate more, understand more and facilitates collaborative learning between students. It also makes them to be independent in their learning and remember easily what they have learnt."* In support of this Teacher 3 said, *"Students concentrate more, become autonomous, that is, being independent of the teacher in learning. Peer tutoring fosters collaborative work between students. It also makes them remember more easily what they have learnt."* Tighe emphasizes the social processor learning that Bruffee (2000) said *"Real learning.....is not solitary task. One person cannot be expected to discover five different interpretations of a piece of literature. But five people can. Each student can examine his/her ideas in relationship to those of his/her peer group."*

The next section will look into the tools that are used and their benefits in peer tutoring.

4) What tools does your teacher use to make you understand when he/she uses peer tutoring?

"The use of videos containing lessons that show chemical reactions and practicals processes helps a lot. Visual demonstrations assist as we will be able to remember them. Whenever you want to do a practical you can just refer to the videos anytime", said focus group C. From the findings of the study, it showed that all participants agreed to the same tools being used during peer tutoring. Briner (1999) emphasized on Vygotsky's theory on Zone of Proximal Development(ZPD) where he said that this zone is the area of exploration for which the student is cognitively prepared but requires help and social interaction to fully develop. This simply means that a learner can explore on their own but they need assistance to fully develop to their best level. The use of tools and peer learning assists in the teaching and learning of chemistry. The majority of the participants agreed that the use of laboratory apparatus and equipment helped them greatly when doing practical learning. It made them to be more involved in their learning. The use of cellphones and laptops also assisted them as they are able to share resources such as notes in form of soft copies. The participants also argued that the use of charts played a pivotal role in the learning and teaching of chemistry. Focus group B said, *"Charts of chemical reactions and practicals are used by the teacher during lessons. This helps us to remember and also able to solve problems. Charts act as constant reminder in learning. The teacher also asks or give practice questions. The method always makes us to be geared up everytime as you wouldn't know when the practice questions will be given."* Some students are even asked to do some case studies or real life situations which help learners to understand the concepts being taught.

The next question is on strategies used by teachers to enhance peer tutoring

5) What strategies do teachers use to enhance peer tutoring?

Teacher is able to enhance and improve peer tutoring strategies by implementing them. Various strategies were put in place by the teacher according to the results of the researcher. *"The teacher groups us with learners who are above average and those who are below average. This allows us to be able to be taught by those who are fast learners. Unlike being taught by the teacher, I can easily understand my peer as he/she will be using a language which we as peers can understand each other,"* said focus group D. This is in line with a research that was conducted by Crossgrove and Curran (2008) suggested that breaking large lectures into small groups in which peer instructors facilitates group work dramatically increases the interactive engagement of students. Strategies help learners to focus, be actively involved during lessons and even improve their participation. One of the peer tutors from focus group A felt the strategies being implemented by the teacher helps them to improve their tutoring skills. She said, *"The teacher encourages us as tutors to reflect on our tutoring experiences, that is, giving a feedback on how we are using peer tutoring. If there are approaches that worked or didn't work or which we think might be added. Or in general if we are experiencing any challenges or difficulties. This allows us to improve our skills with time."* Giving out challenging tasks improves the teaching and learning process. This point was emphasized by focus group B saying, *"The teacher sometimes uses online quizzes during peer sessions and this helps us in focusing and paying attention on the work given. As learners, this makes us gain experience and knowledge as online quizzes are a bit challenging. This also makes us to be fast there will be time limits."* From these results it shows that the use of ICT tools is also crucial in the teaching and learning of chemistry using peer tutoring. The next section will look on how peer tutoring assist to develop higher order thinking skills.

6) How does peer tutoring assist learners to develop in higher order thinking skills, that is, critical thinking, analysis and problem solving?

The following are the participants' responses. The learners felt it made them to be critical thinkers, be able to analyse each situation and to solve problems without the teachers' interference. This also made them to be independent of the teacher in their learning. For example, focus group B agreed to this statement. They said, *"Peer tutoring develops our higher order thinking skills by the questions that would have been raised by the peer tutors we will be forced to think and be able to respond correctly. It allows us to solve chemical problems and be able to analyse chemical concepts. This also makes us be able to find new techniques to tackle problems leading us to be critical thinkers."* All the participants agreed that peer tutoring greatly assist in higher order thinking skills in learners. This result is supported by Whitman (2012) and

Annis (2013) who argue that peer tutoring helps students perform better on higher order conceptual understanding scales than students who read the material simply for study purposes.

The next section is on the equipment provided by the teacher during peer learning.

SECTION C

7) What equipment do teachers provide learners to enhance peer tutoring?

Learners need enough equipment in order to perform above average. The provision of equipment allows learners to be actively involved in learning and also be to be problem solvers. Majority of the students indicated that several equipment was provided by the teacher which included laboratory equipment and apparatus and safety equipment to use during experiments and practicals. Focus group A implied that, *"The provision of laboratory equipment, safety equipment like goggles, safety shoes and laboratory coats helped enhance peer learning."* Teacher 3 also emphasized how this equipment helped the teaching and learning process. She said, *"For learners to be practical and more attentive during lessons, equipment and apparatus have to be provided for the learners. Also peer tutoring facilitates oneness between students as they will be socializing and sharing equipment."* According to Vygotsky's ZPD theory where the 'zone' is the area of exploration for which the student is cognitively prepared but requires help and social interaction to fully develop. The use of equipment works in line with the theory of ZPD. Learners will be able to explore and interact socially whilst having a lesson. Teacher 4 points out that the tools improve peer motivation and participation. He said, *"Peer learning with equipment to use improves motivational to learners, where learners feel the need or urge to learn more. Increased participation within the learners is quite noticeable. Also it enables critical thinking, thereby enhancing teaching and learning process."* This shows the provision of equipment is vital in the learning process.

The next section looks into how peer tutoring assists learners in the learning of chemistry.

8) SECTION D

How does the use of peer tutoring during lessons assist learners in the learning of chemistry?

In this section we will look into how peer tutoring assist or benefit learners in the learning of chemistry. The use of peer tutoring greatly assist learners in thinking and be able to grasp concepts being taught. Here are some of the responses from the participants. The HOD pointed out that it benefits learners in a huge way and has a positive impact in the teaching and learning of chemistry. He said, *"One of the greatest benefits of peer tutoring is that it can take place at*

ones own pace and time. This allows the learner to be able to meditate and reflect all they would have learnt. Another benefit is that it promotes critical thinking and enhancing teaching and learning process. Peer tutoring is also vital because teachers and learners use them for they supply more tools for problem solving and can serve as a monitoring aid during the problem solving process." Briner (1999) stressed out that a teacher or more experienced peer is able to provide the learner with 'scaffolding', according to Vygotsky's theory, to support the students evolving understanding of knowledge domains or development of complex skills. This was supported by Teacher 2, "Peer learning allows learners to be more interested in their learning process as they will be learning with their peers. They are able to interact with their peers which makes them to be open in questions and answers session. Learners are able to challenge one another during lessons." Vygotsky believed that learning could occur at a greater rate when individuals were challenged by a more knowledgeable or capable individual Hogan and Tughe (2017). The emphasis is on the learning process, including the emotional support that learners offer each other, as much as the learning task itself. Focus group E supported this point saying, "Peer to peer learning leads us learners to respond well to instructions from other peers in ways that are clear. It also builds our communication skills. We will be socializing in way which are understanding each other."

The next question looks into the challenges faced when implementing peer learning.

9) WHAT CHALLENGES DO YOU FACE WHEN INTEGRATING PEER TUTORING IN THE LEARNING OF CHEMISTRY AT ORDINARY LEVEL?

The study revealed that there are a lot of challenges experienced in the use of peer tutoring. Below are the responses from participants on the challenges they face. The majority of the participants indicated that their biggest challenge was the shortage and poor infrastructure. The use of ICT tools like wifi and computers was greatly limited as they were in short supply. This slows down the process of learning and teaching and the use of peer tutoring. Both the teachers and the learners need to do researches on their work/lessons but are limited by the lack of ICT tools to use. Teacher 3 said, "The lack of ICT tools such as wifi and computers hinders the progress of teaching and learning of students. This leads to negative attitudes towards learning especially from learners, making the process difficult to implement or adopt." Another challenge is the lack of training skills to both the teachers and the learners. This brings about the lack of seriousness between the learners and also negative attitudes in the teaching and learning. Focus group A said, "Sometimes you feel as if you are not sure with what you are doing. I think training of peer tutors is very much important as you won't have to be ignorant or act as if you don't know what you are doing. Training boosts our confidence in whatever we will be doing." Some learners agreed that lack of training to both peer tutors and peer learners makes either side to discriminate each other. The peer tutors will feel as if the peer learners are being ignorant if they are unable to grasp what's being taught. The same with the peer learners they feel as if the peer

tutors will be boosting with their abilities as fast learners and good at academics. Peer tutors from focus group A felt if they are all not trained, they will continue to be discouraged. They said, *"We are always discriminated by other learners as they feel we are sidelining them. Being able to catch fast is not our fault but our other peers make it as if we boost around with our capabilities. If we are not trained both the peer tutors and the peer learners, we will end up being discouraged or even have conflicts every time we engage in peer learning. Being a peer tutor should apply to all the learners even for those who are slow learners or below average so they could get an insight of what we will be doing."* Peer learners had their own view. Focus group C said, *"Our peer tutors are so full of themselves and boost around with their ability to catch fast what is taught. At times if you ask a question, they either ignore or just say go and read what we have discussed but knowing very well that I won't understand anything on my own no matter how much I read. And there is favoritism from teachers. Even if you go and complain to the teacher, it will be to no avail as the teacher will just take the sides of the peer tutors. Hence we end up having a negative attitude towards the use of peer tutoring whilst at some instances it benefits us."*

The next section looks on ways to overcome these challenges stated above.

10) WHAT STRATEGIES CAN BE PUT IN PLACE IN ORDER TO OVERCOME THE CHALLENGES THAT SCHOOLS FACE WHEN APPLYING PEER TUTORING?

The participants stressed out a number of ways on what can be done to overcome the challenges they had stated in question (9). Below are their responses. The majority of the responses from the respondents indicated that training on how to conduct peer tutoring effectively and engage ICT tools should be provided in schools. Focus group C said, *"The training of teachers and learners in the use of ICT tools should be emphasized in schools. This improves the teaching and learning of chemistry using peer tutoring. Most tutors find it difficult to use most of the ICT tools as they do not have much knowledge of them."* Teachers indicated that Introductory courses on internet use and general applications such as word processing, presentations, spreadsheets and databases should be provided to learners for them to be able to use some ICT tools when using peer tutoring strategy. The respondents also indicated that equipment specific training on how to use interactive whiteboard, laptops for teaching and learning process. The study also revealed that pedagogical use of peer tutoring in the teaching and learning should be emphasised in schools.

Another strategy is that the provision of courses on how to use multimedia that is using digital video, audio equipment, projectors and this can be provided at school by school staff.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter covers the summary of the findings, discussion of results and recommendations based on the research.

5.2 SUMMARY OF THE FINDINGS

The peer tutoring strategy is a powerful teaching method that can influence teaching and learning process in secondary schools. In classrooms teachers and learners can carry out presentations with aid of ICT tools such as projectors, whiteboards, computers and many others when using this method. The teachers and students believed that there was a positive impact on the use of peer tutoring during the lessons on the aspects that learners' concentrate on their learning, learners feel more autonomous during their learning and facilitate collaborative learning between students and teachers in improving the class where students were more engaged. The respondents

felt there was a great positive impact of the peer tutoring use during lessons on such aspect as students understanding more easily what they learn remembering more easily what they have learned. Peer tutoring strategy have the positive impact in the sense that it proves to be beneficial to both teachers and students in the process of teaching and learning.

The findings of the study revealed that peer tutoring assists for huge sharing of information, working in a collaborative way and learning in an autonomous way which indicated that a general agreement that peer tutoring helps the students in their tasks to work together by using peer tutoring in teaching and learning learners to do exercises and practice whilst helping each other on a given task. The overall peer tutoring positive impact is motivation, academic achievement, competence in higher thinking skills. The findings of the study revealed that teacher anxiety over being substituted by learners in the classroom as the learning process becomes more learner-centred, an acknowledged barrier to peer tutoring embracing can be improved only if educators have a profound appreciative and obligation of their changing part to highlight the significance of peer tutoring usage. Sometimes learners and teachers have a limited accessibility of ICT devices that can be used in the process of teaching and learning of Chemistry as a subject using peer tutoring.

The findings of the study indicated that peer tutoring use in the teaching and learning positively impacts on students in the teaching and learning process. The findings of this study also indicated that both the availability and accessibility of various equipment especially the basic ones in a chemistry laboratory is too low for the use of peer tutoring. Permanent access is non-existent for most of the equipment apart from a few like having desktop computer without internet access, mobile phones provided by the school and a chemistry laboratory equipment and apparatuses. There was no access for most of the equipment and where there was any, it was

very low. The school teachers and learners admitted that during lessons there was a serious shortage and inadequate peer tutoring tools in the secondary schools. This showed that this has a direct negative impact on the use of peer tutoring in schools. Some of the gadgets and equipment were very expensive and the schools' budgets were already far much stretched to accommodate the extra items with budgetary implications.

The participants especially the learners indicated that this makes them to have a negative attitude towards the use of peer tutoring in the teaching and learning of chemistry. The findings of the study from the respondents indicated that benefits of using peer tutoring in the teaching and learning of Chemistry at Ordinary Level were numerous. The respondents indicated that peer tutoring generate three significant milestones: access to teaching and learning chances; cultivating the quality of learning and teaching; and distributing oneness amongst students. In this way, peer tutoring will have a significant impact everywhere in the world with respect to education. However, the study revealed that there were a lot of challenges experienced in the use of peer tutoring strategy. The study revealed that lack of training is one of the biggest challenges faced by both school heads of department (HODs), teachers and learners. The attitude towards the use of peer tutoring is another challenge faced in the adoption of peer tutoring.

The majority of the responses from the respondents indicated lack of pedagogical skills in the engaging peer tutoring in the process of teaching and learning process. Additionally, lack of infrastructure such as interactive whiteboards, laptops, computers, tablets, internet and Wi-Fi are some of the major challenges faced in secondary schools in Seke District. The findings of the study indicated that training on how to facilitate peer tutoring effectively should be provided in schools. More so to equip students with skills they can use when doing peer tutoring such as

introductory courses on internet use and general applications such as word processing, presentations, spreadsheets and databases.

The findings of the study also indicated that there should be peer tutoring on specific training such as how to use interactive whiteboard, laptops for teaching and learning process should be provided. The study also revealed that pedagogical use of peer tutoring in the teaching and learning should be provided in schools. The study also revealed that subject-specific training on learning applications (tutorials and simulations). Another strategy is that the provision of courses on how to use multimedia that is using digital video, audio equipment, projectors and this can be provided at school-by-school staff during the use of peer tutoring.

5.3 CONCLUSION

Based on the findings the study, the following are conclusions guided by the study objectives; The first objective was to determine the perceptions of Heads of Departments, teachers and students towards the use of peer tutoring in the processes of teaching and learning in Seke District. Schools should profoundly revise present teaching practices and resources to create more effective learning environments and improve lifelong learning skills and habits of learning in their students. It must be said, however, that so far peer tutoring has not provided any large-scale breakthrough in learning improvements. They are still promises with great potential. The second objective sought to identify the benefits of using peer tutoring in the teaching and learning of Chemistry at Ordinary Level.

For teachers, peer tutoring provides a medium to establish fluent links among peers from schools worldwide. Teachers can benefit greatly from sharing their experiences, problems and queries

with colleagues in same situations. Of similar importance is peer tutoring, with the availability of a large number of training courses for teachers thus providing new means for professional development regardless of the teacher's workplace. The third objective was formulated to determine the extent to which teachers' preparedness influences peer tutoring in secondary schools in Heads of Departments, teachers and students. Following the peer tutoring experience, it is desirable that the teachers and learners to become an initiative with ample participation. Finally, given the complexities and many problems that will have to be addressed, a gradual approach to the full development of the peer tutoring strategy is advisable. The fourth study objective was to identify the strategies that can be used to ensure successful integrating of peer tutoring in the teaching and learning of Chemistry.

The training on how to use peer tutoring should be provided in schools and teacher colleges for pedagogical appreciation. Introductory courses on internet use and general applications such as word processing, presentations, spreadsheets and databases.

5.4 RECOMMENDATIONS BASED ON THE FINDINGS AND CONCLUSIONS

The study made the following recommendations:

- The teachers and students should have positive attitude for the use of peer tutoring strategy in the process of teaching and learning.
- The ministry of Primary and Secondary Education should provide the equipment in schools because school are failing to provide adequate peer tutoring that can be used in the process of teaching and learning process.
- The teachers and learners should be trained on how to use peer tutoring in the process of teaching and learning. The teachers and learners should have the accessibility to

equipment that can assist in peer tutoring during the lessons. This promotes concentration and the internalisation of the concepts during the lesson delivery.

- Governments should improve the training of HOD's, teachers and students on the use of computers and other ICT equipment which can assist in peer tutoring through seminars, workshops and in-service training.
- The school heads and Ministry of Primary and Secondary Education should develop a long-term program effective for continuous commitment to training and use of instructional technologies and different teaching methods.

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