STUDY HABIT, MOTIVATION AND SELF-EFFICACY AS DETERMINANTS OF PERFORMANCE IN CHEMISTRY AMONG SENIOR SECONDARY SCHOOL STUDENTS IN MINNA, NIGER STATE

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A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF TECHNOLOGY IN CHEMISTRY EDUCATION

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ABSTRACT

This study examined Study Habit, Motivation and Self-Efficacy as Determinants of Performance in chemistry among Senior Secondary School Students in Minna Niger State.The study adopted a correlational and ex-post facto research design. The population for the study was 3,365 senior secondary schools Chemistry Students in Minna, Niger State. Seven research questions were raised to guide the study and seven corresponding null hypotheses were formulated and tested at 0.05 level of significance. A Sample size of 337 students from senior secondary schools was randomly selected, using multi stage random sampling technique. The research instrument used for the study was Motivation, Study Habit and Self-efficacy Inventory (MOSHSEQ). The instrument was validated by one expert in guidance and counselling and experts with good background in psychology at the Department of General Studies from Federal University of Technology, Minna, Niger State, Crombach Alpha was used to obtain the Reliability coefficient index of 0.89 for motivation, 0.87 for study habit and 0.91 for self efficacy. Data collected was analysed using linear regression multiple regression, ANOVA, and Kendall's tau b. Findings from the study revealed that there was significant relationship between student study habit and senior secondary school performance in chemistry, there was no significant relationship between gender and senior secondary school performance in chemistry and there was no significant relationship between self-efficacy and senior secondary school performance in chemistry. Finally, it was recommended that chemistry teachers should adopt measures to strengthen students' motivation, self-efficacy and study habit to boost their academic performance in chemistry and stakeholder as matter of urgent should organize orientation to new chemistry students on how to develop good study habit and self-efficacy.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Affective factors such as study habit, motivation and self-efficacy are very important constructs for chemistry instructional processes and students' learning tasks. The effects of these constructs on learning and educational issues have been the concern of many educators and researchers for decades due to the increasing awareness towards their importance. One of the goals of chemistry education is to develop students' learning skills in chemistry. The goal of helping students to acquire scientific knowledge and the required skills may not have been achieved due to lack of motivation, self-efficacy and poor study habits among senior secondary school students in chemistry (Onyido, 2016).

The importance of chemistry as a requirement for the technological development of a nation like Nigeria cannot be overemphasized. Chemistry is needed to find solution to some specific problems of the nation. For example, the scarcity of some basic building materials such as cement, processed wood, aluminium and so on can be reduced by inculcating knowledge of chemistry. Also, the knowledge of utilizing the available raw materials in the country to manufacturing industries can be improved by the teeming population of Nigerian youths. They can be gainfully employed in small-scale industries such as salt processing industries and pharmaceutical industries using local herbs. These and many other tasks are what chemistry in conjunction with other science subjects such as physics and biology will help Nigeria to accomplish (Onyido, 2016). For chemistry to adequately play these desired roles, the chemistry subject at the secondary school level in particular must be properly taught to prepare the students who take chemistry at this level and improved students tasks in biology and physics as outlined by (Onyido, 2016).

Despite the importance of chemistry to mankind and the efforts of researchers to improve on its teaching and learning, the performance of students in the subject remains low in Nigeria (Odebunmi, 2016). This is shown in Table 1.

Table 1.1: Performance of Students in Chemistry at SSCE Level (WAEC) in Niger State, from 2014- 2018

Year	A1 – C6 (%)	D7 – E8 (%)	F9 (%)
2014	23.23	33.11	41.88
2015	21.19	32.79	45.20
2016	18.32	29.59	50.41
2017	15.58	27.43	55.30
2018	10.25	24.24	63.20

Source: WAEC National Headquarters, Yaba Lagos (2018)

Table 1 revealed a decrease in percentage pass rate at credit level from 23.23% to 10.25% between 2014 and 2018, while percentage failure rate increases from 41.88% to 63.20% between 2014 and 2018 respectively. These shows that chemistry students have problems or difficulties in the learning of chemistry which has resulted to poor performance at senior secondary school level.

Among the factors that have been identified to be responsible for student performance in chemistry are, poor methods of instruction Osuafor (2017) poor attitude (Igboegwu & Okonkwo, 2012), laboratory in-adequacy (Bajah,2012;Faruk, 2013; Oluwatimilehin & Owoyele 2012; Raimi, 2015) and poor science background (Oshokoya, 2014) and (Adesoji, 2016). Psychological factors such as motivation, attitude, interaction, academic self-efficacy, family problems, and stress and study habit. (Li, 2012; Adediwura & Tayo, 2017) are some of the identified factors.

Students' study habit of learning of chemistry is a factor that has long attracted attention of researchers. Azikwe (2017) describes study habit as the adopted way and manner a student plans his private readings after classroom learning so as to attain mastery of the subject. Study habits have been observed to affect the academic performance of students to a great extent and students can have good or bad study habits (Odebunmi, 2016). Students with poor study habits are more exposed to failure compare to students who have good study habits. Good study habits act as a strong indicator for the students to excel in life because if students do not possess good study habits they cannot excels in life (Amandeep & Raj, 2015). Singh (2011) in their independent studies revealed that there is strong positive correlation between study habit and academic performance of elementary, secondary and college students. However, Lawrence (2014) observed no significant relationship between study habits and academic performance of higher secondary school students. Ojo (2016) and Adesokan (2013) asserted that in spite of realization of the recognition given to chemistry among the science subjects, it is evident that students still show negative study habit towards the subject, thereby leading to poor performance and low enrolment.

Another factor observed to affect students performance in chemistry is self-efficacy. Academic self-efficacy is the belief that an individual can efficiently perform some tasks that usually influence his or her own behavior in a positive way. Self-efficacy was originated from social cognitive theory of Albert Bandura which indicated that, there is a significant interaction between individual, environment, behaviour and cognitive factors (Bandura, 2016). Self-efficacy is an "individual's confidence in their ability to organize and execute a given course of action to solve a problem or accomplish a task" (Eccles, 2010). "Self-efficacy is a belief in one's capabilities to organize and execute the causes of action required to manage prospective situation (Bandura, 2016). Self-efficacy implies

the belief that we are efficient to do something determines our behaviour at the end. Meaning of self-efficacy played a great role in determining how an individual feeling and thought motivated themselves, which then ultimately influenced their behaviour and the outcome (Bandura, 2016). This implies positive self-efficacy of students will lead to good motivation during teaching and learning process and this will in turn lead to positive behaviour and improvement in students' performance in chemistry**.**

According to Schunk (2013), academic self-efficacy refers to individuals' convictions that they can successfully deliver any academic tasks at designated levels. Moreover, "Academic self-efficacy refers to students' perceptions of their competence to do their classwork" (Midgley *et al.,* 2011). Bandura theory of self-efficacy argued that, human behavior can be predicted by individual levels of confidence in their ability to succeed in a specific task (Bandura, 2016). Self-efficacy is one of the important aspect of social cognitive theory because most of the individual level of self-efficacy are from external experiences and self-perception which determine the results of tasks and circumstances they encountered (Bandura, 2016; Dollard & Miller, 2012;). Researches have revealed that self-efficacy play a significant influence on human behaviour and this cannot be overemphasized because people use to have high self-efficacy in some situation and lower in others, this shows that it is a behavioural change and it depends on one's situation or condition (Ando & Asakura, 2016; Bandura, 2016).

Students who believe in their own self-efficacy understand their subject matter very well, are ready to fulfil their students' expectations, make their teaching approach enjoyable and persistently explore ways that work best for their individual learners (Anthony & Kritsonis, 2010). Uitto (2014) found out that chemistry and other science self-efficacy predicted achievement at the college level. Also Self-efficacy was found to be a good

predictor of performance and engagement with science-related activities than gender and parental background.

Alay and Triantoro (2013) used power control theory to explain possible negative effects of self-efficacy; it was observed that an individual with high levels of self-efficacy tend to invest fewer resources in achieving their goals than individuals with low efficacy beliefs. Therefore, the subsequent effects of self-efficacy upon performance might produce a null or negative reciprocal relationship. Korso (2013) investigate gender and school type differences in self-efficacy in teaching. It was revealed that female beginning pre-service teachers in Ethiopia and those teaching in public schools tend to have lower levels of self-efficacy.

Motivation is one of the important impulsive power sources which gives some guidance to behaviour of students in school and determines behaviour strength and stability. Motivation is a repulsive power to conduct organism attaining to certain goal and being able to do necessary actions in particular conditions, giving energy and a guide to behaviours causing an affective advance. In order to learn, each student has to participate in the teaching learning process willingly.The students should also obey the required learning principles and bare responsibility for pertaining to learn. Therefore, providing a necessary motivation and giving priority to motivation for learning are among the major duties of teachers and school. There are differences in principle between motivated and non-motivated student behaviours. When an individual is motivated, maintenance of being interested and paying attention, willingness to make an effort and coursing of necessary time to gain behaviours, focusing and devoting on the subject, not giving up doing demanded behaviour in difficult circumstances, insisting on bringing to an end and resolution are observed. Adegoke (2014) reported that students' motivation improve

students' academic performance in science subject in secondary schools and gender was not significant.

The issues of gender on students' academic performance in science subjects have become the global debate. Gender refers to the social meanings associated with being a male or a female, including the construction of identities, expectations, behaviours and power relationships that derive from social interactions. Therefore, researcher aimed at examine study habit, self-efficacy and motivation as determinants of performance in chemistry among the senior secondary school in Minna, Niger State

1.2 Statement of the Research Problem

There is parents and stakeholders outcry about the poor performance of student in Nigeria. The National Examination Council (NECO) and West African Examination council (WAEC) have revealed that, student performance in chemistry at Senior Secondary School Certificate Examination (SSCE) have been consistently poor (WAEC, 2018).

However, in spite of the central positions it's played, its importance in sustaining growth and development, poor performance of student in the subject has been a major concern. Most of the researchers and stakeholders in education sectors shift the blame on teachers, environmental, poor science background and poor method of instructions. Linked poor performance to students' factors like poor study habit, poor motivation, and low self-efficacy of students towards chemistry.

Nevertheless, study habit, motivation and self-efficacy played important role in learning of chemistry. In spite of that, limited research has been conducted with little or no attention given to students' factors in Nigeria. To investigate the above issues, this study examined study habit, motivation, self-efficacy as determinants of performance in chemistry among the senior secondary school in Minna, Niger state.

1.3 Aim and Objectives

The aim of the study is to examined study habit, motivation and self-efficacy as determinants of performance in chemistry among the senior secondary school students in Minna, Niger State.

The study strives to specifically achieve the following objectives;

1. Determine the influence of study habit on senior secondary school students performance in Chemistry.
2. Investigate the influence of gender on senior secondary school students performance in chemistry.
3. Investigate the influence of self-efficacy on senior secondary school students performance in chemistry.
4. Determine the influence of self-efficacy, gender on senior secondary school students performance in chemistry.
5. Investigate the relationship between students' motivation and senior secondary school performance in chemistry.
6. To find out the influence of motivation, gender and senior secondary school performance in chemistry
7. Find out influence of self-efficacy, study habit and motivation on senior secondary school students performance in chemistry

1.4 Research Questions

The following research questions were formulated to guide the study;

1. What is the influence of student study habit on performance of senior secondary school students in Chemistry?
2. What is the influence of gender, on senior secondary school students study habit in chemistry?
3. Determine the influence of self-efficacy on senior secondary school students' performance in chemistry?
4. Examine the influence of self-efficacy, gender on senior secondary school students' performance in chemistry?
5. Compare the influence of students' motivation on senior secondary school students' performance in chemistry?
6. What are the influence of motivation, gender and senior secondary school students' performance in chemistry?
7. What is the influence of self-efficacy, study habit and motivation on senior secondary school students' performance in chemistry?

1.5 Research Hypotheses

The following null hypotheses will be tested at 0.05 level of significance

HO_1: There is no significant relationship between student study habit and their secondary school performance in Chemistry

HO_2: There is no significant the relationship between gender and senior secondary school performance in chemistry

HO_3: There is no significant relationship between self-efficacy and senior secondary school performance in chemistry

HO_4: There is no significant relationship between self-efficacy, gender and senior secondary school performance in chemistry

HO_5: There is no significant relationship between students' motivation and senior secondary school performance in chemistry

HO_6: There is no significant relationship between motivation, gender and senior secondary school performance in chemistry

HO_7: There is no significant relationship between self-efficacy, study habit and motivation on senior secondary school performance in chemistry

1.6 Significance of the Study

This study will be of benefit to chemistry teachers, students, parents and educational authorities and government.

The findings of this study would be beneficial to classroom teachers in discharging their duties in the school by ensuring strict compliance on student use of library.

Students would benefit from suggestions on particular characteristics such as self-efficacy and study habits that will enhance performance in chemistry in order to yield success in their academic career.

Education authority would benefits from the findings by giving them adequate information on the need to have libraries that are well equipped.

Teacher trainers would get useful information on how teachers" attitudes, students' motivation, study habit and self-efficacy contribute to performance in Chemistry and how it could be enhanced. Policy formulators would gather useful information which would shed more light on why the interventions so far implemented have not so far yielded

required outcome. This would enable policy implementer adopt only those strategies that promotes good performance in Chemistry.

To the government, findings from the study will give information to the government on the areas where there will be need for more intervention and improvements for science teachers, particularly in the area of teachers improved welfare package in the state this will motivate both the teachers and the students for excellent academic performance.

1.7 Scope of the Study

This study was limited to secondary schools within Minna, Niger State. It was focused on senior secondary School two class (SSS II) students. The choice of schools will be five (5) selected schools within the study area. The study was carried out in Minna among senior secondary school students in Niger state. The study has three independent variables and one dependent variable. The independent variables are; Study habit, self-efficacy and motivation while the dependent variable is the academic performance. Also it has one moderating variable; the study lasted for six week.

1.8 Operational Definition of Major Terms

The following terms were used in this work as described below:

Performance: Students assessment in their work by the use of tests and assignment.

Determinant factors: This refers to factors that predict students' performance in learning of chemistry.

Chemistry: Is the branch of science that study the structure, composition and properties.

Study Habit: This refers to students adopted learning strategies applied to learning of Chemistry.

Gender: This refers to the social meanings associated with being a male or a female.

Motivation: This refers to desire, need or want that generates the energy required for students to learn chemistry.

Self-efficacy: Is refers to an individual's confidence in their ability to complete a task of a goal in chemistry instruction**.**

Low self-efficacy: Is characterized by a lack of confidence in chemistry as a subject.

High self-efficacy: Is characterized by a high level of confidence in chemistry as a subject.

Positive motivation: Is the type of motivation a person feels when he expects a certain reward during chemistry instruction.

Negative motivation: focus on the consequences of underperforming and failing to meet goals in chemistry lessons.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Conceptual Framework

A conceptual framework is an analytical tool with several variation and contexts. It can be applied in different categories of work where an overall picture is needed. It is used to make conceptual distinctions and organized ideas. Strong conceptual frameworks capture something real. According to Akintoye (2015), a conceptual framework is used to illustrate what you expect to find through research, including how the variable relate to each other. A conceptual framework (Figure 1) guided the study. The conceptual framework postulated that chemistry students' performance depends on study habit, self-efficacy and motivation, studies have shown that performance of students depends on students study habit, motivation and self-efficacy.

Figure 1 showing the impact of study habit

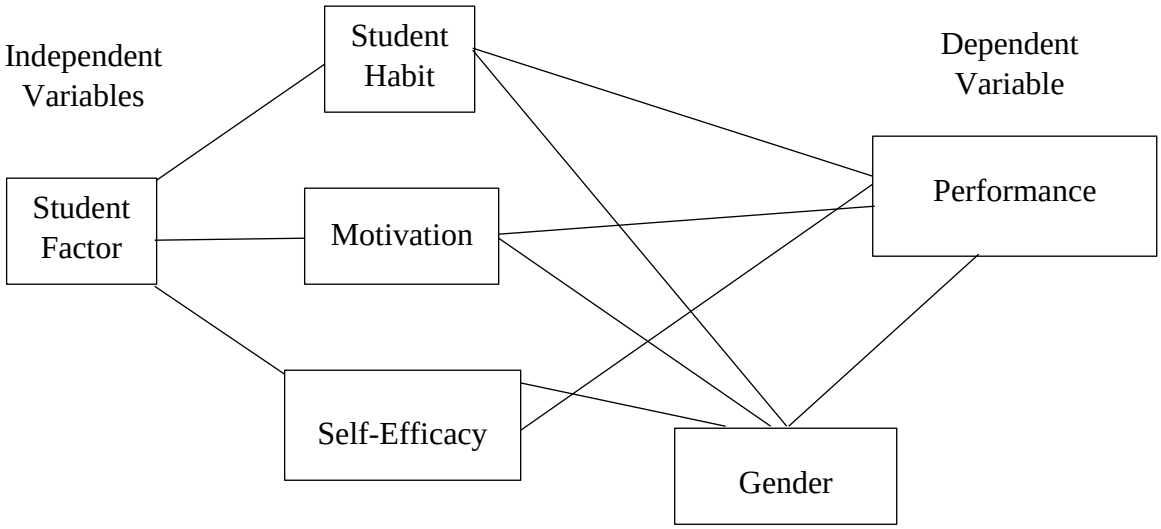

Figure 2.1: Conceptual Framework

From the figure, the independent variable (study habit, motivation and self-efficacy). The moderating variable is gender. If chemistry students lack study habit, motivation and self-efficacy. If any chemistry student lacks any of the listed independent variables, it can hinder their performance in chemistry as a subject in secondary school.

2.1.1 The Nigerian Senior Secondary School chemistry curriculum

Chemistry is one of the important subjects in science, not only because of its numerous and fundamental connections with other branches of science, but also because of its wide-ranging influence on the way we live. Onyido (2016) views chemistry as the science of materials in the natural and built environment and that it is pivotal to the development, sustainable use and appropriate management of the built and natural world. Chemistry is one of the means by which humans describe reality. It deals with all of the substances making up the environment and with the changes these substances undergo.

Chemistry in particular comprises four components—the processes used to obtain (discover or create) chemical knowledge; the general concepts and specific ideas so produced; the applications of that knowledge in understanding and changing the world; and the implications of that understanding and change for individuals and societies (Cheng & Gilbert, 2017). They also argued that understanding chemistry requires understanding: the nature of chemistry, its norms and methods; the key theories, concepts and model of chemistry; how chemistry and chemistry-based technologies relate to each other; and appreciating the impact of chemistry and chemistry-related technologies on society.

Chemistry can contribute to the development of students' scientific literacy (Mumber & Hunter, 2009) and provides a concrete foundation for further studies or careers. Generally, the broad aims of the chemistry curriculum stated by the revised edition of the Nigerian

Senior Secondary School Chemistry Curriculum (Federal Republic of Education, 2014) expects among other things, that chemistry will enable students to: develop interest in the subject of chemistry; acquire basic theoretical and practical knowledge and skills; develop interest in science, technology and mathematics; acquire basic STM knowledge and skills; develop reasonable level of competence in ICT applications that will engender entrepreneurial skills; apply skills to meet societal needs of creating employment and wealth; be positioned to take advantage of the numerous career opportunities offered in chemistry; be adequately prepared for further studies in chemistry.

In addition, it is expected that the revised curriculum (FRN, 2014) will facilitate a smooth transition in the use of scientific concepts and techniques acquired in the new Basic Science and Technology curriculum with chemistry; Provide students with the basic knowledge in chemical concepts and principles through efficient selection of contents and sequencing; Show chemistry in its inter-relationship with other subjects; Show chemistry and its link with industry, everyday life activities and hazards; Provide a course which is complete for students not proceeding to higher education while at the same time provides a reasonably adequate foundation for a post-secondary chemistry course.

Internationally, it is generally accepted by researchers and educators (Mulhall & Berry, 2016) that science and chemistry in particular, needs to be taught in engaging ways. However, chemistry has been taught with conventional method, the focus has been on covering the curriculum which often involves well-structured problems, mechanical and algorithmic laboratory work and the rote learning of a body of knowledge (Osuafor, 2017). Students have difficulty understanding the relevance of the content to their everyday lives when it is presented in this way. Furthermore, research has revealed that students in Nigerian secondary schools have difficulties in learning chemistry as a subject and have found the subject boring (Olaleye *et al.,* 2008).

2.1.2 Concept of motivation in education

Motivation is an important variable in this study. As motivation cannot be observed directly but it can rather be inferred from behaviors such as goal-directed activities and task choices. Motivation has a very important role in learning even though some simple types of learning can occur without motivation. Students with high motivation engage in instructional activities and show greater effort on learning tasks more than the students who have less motivation. Therefore, teachers understand the importance of motivation for learning and try to raise their students' level of motivation, and researchers seek to find out ways to improve students' motivation to learning (Schunk, 2013). How students become more motivated? This question has been one of the primary concerns of educational studies. There are a lot of influences that make students more motivated. This motivational effect depends on self-efficacy as invented by (Bandura, 2016).

Motivation refers to the act of using something (cash or kind) to encourage an individual to perform his or her duty in an expected manner. To this author, motivation may include the needed environmental conditions in which the chemistry teacher will perform his/her duties. Ofoegbu (2014) is of the view that motivation is a force that is capable of reducing tension, stress, worries and frustration that spring up from a problematic situation in a person's life. Stress and worry are traceable to work situation where it is referred to as negative organizational motivation. What constitute student's and teacher motivations are those factors that operate within the school system which if not available to the students and teacher would reduce performance, cause stress, discontent and frustration that subsequently reduce both teacher and student output qualitatively (Ofoegbu, 2014). This means that in order to improve performance on the part of students, teachers have to be adequately motivated so that he/she is gingered to do something in an expected manner.

In support of the above Nwani (2011), notes that for a teacher to live up to expectation in curriculum implementation, such a teacher must be motivated. He/she must in addition to getting his salaries and entitlements, be given other incentives and necessary materials which will make his/her work easier and faster. The contending issue here is how are chemistry teachers being motivated so that they can do the work of implementing secondary education chemistry curriculum well, in order to have high performance in the subject also extrinsic motivation is engaging in a task so as to get external reward. Extrinsic motivation orientation sustains and drives behavior when individuals or learners complete tasks to get an external reward (Nwani, 2011).

Chemistry teachers need to be motivated by all stake-holders in education by caring for them in terms of prompt payment of salaries, promotion and payment of hazard allowances, be provided conducive and well-furnished offices and well equipped chemistry laboratories full of consumable materials (cotton wool, litmus papers, filter papers, reagents and indicators) as well as non-consumables (beakers, burettes, test tubes and test tube holders and weighing balances). They need to be sponsored to conferences and for in-service training programmes. Above all, only qualified students need to be admitted to ensure smooth flow of knowledge. Generally, motivating teachers is very important because without teachers, the educational objectives as specified in National policy on education for all levels of education will not be achieved. Reformers of education may establish new schools, effect changes on the structure of curriculum, recommend and prescribe teaching methods and aids but in end, the teacher will be responsible for applying them. When the applier is not happy, the application will be stalked or marred. This is the more reason; the chemistry teacher should be highly motivated, which in turn motivate chemistry students. Government and employers failure to fulfil promises that border on labour matters often lead to industrial disputes that may

last for months as witnessed with Nigerian Union of Teachers (NUT) in recent past over the issue of Teachers Salary Structure (TSS), this is non-motivational. In a situation such as this, how can a well-designed chemistry curriculum be fully implemented? Teachers' monthly take-home salaries and allowances are very poor and unattractive, and as such, cannot sustain them in the face of the rising cost of living (Nwani, 2011).

2.1.3 Concept of self-efficacy in education

Self-efficacy was found to be a good predictor of performance and engagement with science-related activities than gender and parental background (Uitto, 2014). Students' beliefs in their abilities to achieve desired goals strongly influence their academic performance, also academic self-efficacy reflects the extent to which students believe that they can successfully perform in school.

Self-efficacy concept which was defined by Bandura (2016), as personal beliefs about one's capabilities to learn or perform actions at designated level has been regarded as a key motivational factor and a crucial concept in educational concerns for several decades. Self-efficacy influences the extent to which students engage in and persist at difficult tasks.

Students with high self-efficacy beliefs are apt to establish more difficult goals and are more persistent to succeed these goals compared to students with low self-efficacy beliefs (Schunk, 2013). Similarly, the study showed that students with high self-efficacy beliefs tried to come over challenging tasks more and longer than the students with low self-efficacy. On the other hand, students who have low self-efficacy beliefs are inclined to show low study habit and to show less interest toward school subjects (Usher & Pajares, 2008). Furthermore, previous research studies showed that self-efficacy was a reliable predictor of students' academic performance Uitto (2014).

Self-efficacy, also called perceived ability, refers to the confidence people have in their abilities for success in a given task (Alay &Triantoro, 2013). If they possess the ability to successfully perform, then that task will be attempted. The task will be avoided if it is perceived to be too difficult (Babar *et al.*, 2010). Although in efficacious individuals usually avoid challenging tasks, when they do attempt them they give up more easily than individuals with high efficacy. When in efficacious individuals fail, they attribute the unsuccessful result to a lack of ability and tend to lose faith in their capabilities. When they succeed, they are more likely to attribute their success to external factors (Bandura, 2016).

If students master a challenging task with limited assistance, their levels of self-efficacy rise (Alay & Triantoro, 2013). Individuals who possess a high degree of self-efficacy are more likely to attempt challenging tasks, to persist longer at them, and to exert more effort in the process. If highly efficacious individuals fail, they attribute the outcome to a lack of effort or an adverse environment. When they succeed, they credit their performance to their abilities. It is the perception that their abilities caused the performance that affects the outcome rather than their actual abilities (Babar *et al.*, 2010).

Four factors determine self-efficacy: enactive mastery experience, vicarious experience, verbal persuasion, and physiological and emotional states Dogan (2015). The most influential of these factors is enactive mastery experience, which refers to individuals' experiences with success or failure in past situations. Information gathered from these experiences is then internalized. Past successes raise self-efficacy and repeated failures lower it, which indicates to individuals their levels of capability (Bandura, 2016). In a vicarious experience, individuals compare themselves to peers whom they perceive are similar in ability and intelligence to themselves. Watching peers succeed raises observer's self-efficacy and seeing them fail lowers it. Exposure to multiple successful role models

helps increase self-efficacy in observers. Verbal persuasion tries to convince individuals, who may doubt their capabilities, that they possess the skills needed for success at a given task.

In education, verbal persuasion delivered by teachers often takes the form of verbal feedback, evaluation, and encouragement. Persuasion must be realistic, sincere, and from a credible source; otherwise it can negatively affect student self-efficacy beliefs. Emotional state can either positively or negatively affect interpretation of an event's outcome Dogan (2015). In addition to the four factors that determine general self-efficacy, aptitude, attitudes, and attributions are found to predict science self-efficacy (Alay & Triantoro, 2013). Efficacy beliefs vary between individuals and will actually fluctuate within an individual for different tasks, in many activities, self-efficacy contributes to self-esteem (Babar *et al.,* 2010).

Self-efficacy beliefs affect how people approach new challenges and will contribute to performance since these beliefs influence thought processes, motivation, and behavior (Nuthana & Yenagi, 2015). Self-efficacy is not static and can change over time resulting from periodic reassessments of how adequate one's performance has been.

2.1.3.1 Sources of self-efficacy in education

In Education, self-efficacy is a key contributing factor to learners' success, because self-efficacy "influences the choices learners make and the courses of action they pursue" (Usher & Pajares, 2008). Generally, self-efficacy is influenced by four main sources: enactive mastery experience-that is, hands-on experience; vicarious experiences-that is, other people's experience; verbal persuasion-that is, appraisal or feedback from others; and physiological and affective states-that is, stress, emotion, mood, pain, and fatigue (Hodges, 2008). Once self-efficacy is established, it can be applied to similar learning

situations. The closer these situations are to those in which self-efficacy has been improved, the stronger the effect these sources are selected, interpreted and integrated into a total estimate of self-efficacy that in turn influences subsequent, cognitive, motivation, emotional and selective processes.

2.1.3.2 Self-efficacy on educational performances

In line with the theory, academic self- efficacy beliefs affect students educational performance due to the effects they produce through four psychological processes (Bandura, 2016) namely, the cognitive, motivational, and affective and selection processes:

Cognitive level: the nature of beliefs students hold about their abilities in relation to a given task influences the way they perceive their prospective future academic results. Students who believe in their abilities visualize successful positive outcomes while those who do not trust their capacities are likely to suffer from what Bandura (2016) referred to as cognitive negativity. A state where they become somewhat obsessed by their shortcomings and too skeptic about their capacity to succeed in the face of challenging learning situations.

Motivational level: a high sense of self –efficacy increases students' readiness to invest efforts in their learning, serves them well to persist when facing difficulties and helps them to recover more quickly after a negative attainment. Conversely, a perceived sense of inefficacy diminishes students' interest in their learning, lessens from their capacity to resist when facing impediments and undermines their commitment to achieving their goals.

Affective level: a strong perceived sense of competence is likely to reduce the amount of stress students might experience in the course of their learning whereas a low self-

estimation of capacity might result in high levels of anxiety and agitation that often lead to in irrational thinking that ultimately impair their cognitive and intellectual effectiveness.

Selection level: the conceptions that students develop about their academic abilities are likely to influence the type of decisions they take, the environment they opt for and the kind of choices they select. It is often the case that students often engage in activities in which they feel efficacious while they avoid those in which they feel less competent.

2.1.4 Concept of study habit in education

Study habits act as a strong indicator for the students to excel in life, if students do not possess good study habits they cannot excels in life (Amandeep & Raj, 2015). Study habit is an adopted way and manner a student plans his private readings, after classroom learning, so as to attain mastery of the subject (Azikwe, 2017). Study habit can be measured directly through assessment, inventories, reports, examinations and rating scales. Study habit can be the students' way of study whether systematic, efficient or inefficient. It literally means that good studying habit produces positive academic performance while inefficient study habit leads to academic failure (Ayodele & Adebiyi, 2013).

Good students are not born but are made by constant and deliberate practice of good study habits, for which there is no substitute (Ames & Archer, 2014). Many students are not performing very well in the school not because they lack ability, but because they do not have adequate study habits. Study habit is the tendency of a student to learn in a systematic and efficient way, when opportunity is given (Rana & Kausar, 2011). Nuthana and Yenagi (2015) found significant correlation between study habits and academic performance.

De-Escober (2012) observed that students need to be familiar with the relation of good study habits and academic performance to accomplish great success in any level of education. According to Nneji (2015), study habits are learning tendencies that enable students work privately. Crede and Kuncel (2014) noted that study habits denote the degree to which the student engages in regular acts of studying that are characterized by appropriate studying routines (for instance, reviews of material) occurring in an environment that is conducive to studying. Thus, in order to improve academic performance of students, it seems essential to improve their study habits without which desired outcomes cannot be achieved. Development of good study habits in children depends upon the combined efforts of parents and teachers (Kizlik, 2016).

Gettinger and Seibert (2015) stated that students, who demonstrate poor study habits, are most likely the ones to have low academic performance. Having good study habits could reduce the failure rate within educational institutions since studying tends to increase a student's academic ability (Gettinger & Seibert, 2015). Garner-O'Neale and Harrison (2013) in their study discovered that those students with poor study habits achieved relatively the same grades as those students with good study habits for the group theory test that were taken. They further noted that one would think that those with better study habits would have scored higher on the test but a student may possess average good study habits but it is possible that he/she is lacking in a particular area. This shows that study habits may affect male and female students positively or negatively in Nigerian schools.

Study habit can be measured directly through assessment, inventories, reports, examinations and rating scales. Study habit can be the students' way of study whether systematic, efficient or inefficient. It literally means that good studying habit produces positive academic performance while inefficient study habit leads to academic failure (Ayodele & Adebiyi, 2013). Good students are not born but are made by constant and

deliberate practice of good study habits, for which there is no substitute (Ames & Archer, 2014). Many students are not performing very well in the school not because they lack ability, but because they do not have adequate study habits. Study habit is the tendency of a student to learn in a systematic and efficient way, when opportunity is given (Rana & Kausar, 2011). Nuthana and Yenagi, (2015) found significant correlation between study habits and academic performance. It further revealed that reading and note-taking habits, habits of concentration and preparation for examination had significant correlation with academic performance.

2.1.5 The challenges of teaching senior secondary chemistry

The challenges of teaching senior secondary chemistry by Majek (2008) were:

School related problems

The problems mentioned by the teachers included overcrowded classrooms and a lack of: school laboratories; laboratory apparatus and equipment; instructional materials; sufficient time allocated for chemistry lessons; career officers/counselling and guidance units in school to direct and guide students; and, proper screening of junior secondary school students to identify those qualified to study chemistry in senior secondary school. School lack chemistry laboratory and sufficient apparatus to perform experiment, practical classes are occasionally and mostly merge with other schools during final examination period, large population, insufficient time allocated for chemistry lesson and lack of instructional materials, no students 'counsellor and proper screening before assign student to a course.

ii. Government related problems

The problems mentioned by the teachers included: an overcrowded syllabus and curriculum packages that change frequently; inadequate supply of qualified chemistry teachers; and, poor funding to develop teaching materials. Government refuses to employ

qualified chemistry teachers for more hands in schools; poor funding to improvise teaching materials where necessary; overcrowded syllabus and constant changes of curriculum

iii. Teacher related problems

The teachers mentioned: inadequate remuneration and hazard allowance; irregular in-service training opportunity for teachers to update their knowledge; ineffective planning and preparation of lessons to make teaching lively and interesting; lack of cordial teacher-student relationship; lack of teacher‘s knowledge for teaching abstract chemistry concepts; inadequate evaluation of students‘ learning; and, teachers overloaded with other responsibilities in the school. Poor remuneration for chemistry teacher; irregular attendance to seminars/workshop to keep teachers‘ current in the field; lack of teacher adequate preparation prior to the lesson, poor teacher/student relationship; and most at times teacher lack mastery for teaching abstract concepts; and chemistry teachers assigning for other responsibilities in schools.

iv. Parent and student related problems

Problems mentioned by the teachers included: lack of support for children from parents to buy necessary textbooks; students’ poor study habits and attitudes to chemistry; and, students’ poor background knowledge of junior secondary school (JSS) science. Students lack parent support to buy necessary textbooks; students’ lack of interest to chemistry and poor study habit; students’ background at JSS level is poor where some enter science class because of peer pressure

2.2 Theoretical Framework

2.2.1 Maslow’s Motivational Theory

This is another important theory that is relevant to this study. The theory was developed by Abraham Maslow (1970), and popularized by many researchers including (Oliver,

2010). According to Maslow, motivation is constant and never ending, fluctuating and complex. He asserted that man always has needs to satisfy. These needs, according to him are arranged in a hierarchical order starting from the basic or lower order needs to higher order needs. The hierarchy is categorized into two, namely Deficit needs (physiological, safety, belonging and self-esteem) and growth needs (self-actualization). Maslow explained that once a particular need is satisfied, it ceases to be a motivator of behavior and another need emerges. The above theory relates to this study because motivation is very important in learning. It is necessary at home and in school. One of the major problems confronting teachers and parents is that of motivating learners to perform assigned tasks to meet or even excel predetermined standards. Motivation energizes behavior sustenance, direct, regulates behavior and enhances selective behaviour.

A learner under motivated condition, exhibits purposeful behavior aimed at achieving the set goals. The students are motivated to learn by their satisfaction of needs like physiological: Shelter, food, water, rest etc. Safety: materials love and belonging. The satisfaction of these needs leads to the quest to satisfy higher ones which are self-esteem and self-actualization needs.

2.3 Empirical Studies

2.3.1 Motivation and students' performance in chemistry

Vrtacnik *et al*. (2010) investigated the relationship between high school students' motivational profiles and chemistry performance. A total of 361 high school students (164 males and 197 females) having an average age of 16.36 participated to the study. The participants were from urban and rural population with mixed socioeconomic status and were randomly selected from ten high schools in Slovenia. A questionnaire was designed to assess different components of students' motivation for learning chemistry such as

intrinsic motivation and academic self-concept. It included 31 items with a five point Likert type scale. The results showed that students' motivational profiles were very important for their academic achievement. Students from good quality motivation group had greater achievements in chemistry lessons than the students from bad quality motivation group.

Guluzar and Omer (2011) carried out the study on the relationship between academic performance and motivation pre-service chemistry teachers (n=168) completed the Academic Motivation Scale (AMS) which was prepared as an instrument. The AMS consisted of 28 Likert-type scale questions related to intrinsic motivation (to know, toward accomplishment, and to experience stimulation), extrinsic motivation (identified, introjected, and external regulation) and motivation. The results indicated that there is only one significant relationship that is between academic achievement and two intrinsic motivation subscales (to know and to experience stimulation). Besides, females got higher scores in all motivation types. The results show only significant differences between males and females for intrinsic motivation to experience stimulation. With regard to year level, there is significant difference in motivation by year in one subscale of extrinsic motivation introjected.

Devetak and Glazar (2010) investigated the relationship between students' intrinsic motivation for learning chemistry, formal reasoning abilities, and chemical knowledge. A total of 386 students attending second year of the general type of secondary school participated to the study in Slovenia. The average of the students' age was 16.3. The sample represented an urban population including several socioeconomic statuses. In gathering data the tests used were Chemical Knowledge Test, Test of Logical Thinking and Intrinsic Motivation for Learning Science Questionnaire. Chemical Knowledge Test includes 19 items and its internal consistency reliability Cronbach's alpha value was

calculated as .80. Test of Logical Thinking is a 10 item group paper-pencil test, and it had a high reliability (Cronbach's alpha was .85). Intrinsic Motivation for Learning Science Questionnaire is a five-point Likert type scale including 125 items. The reliability coefficient of this test was calculated as .78. The results of the study showed that there was a moderate but statistically significant correlation between students' intrinsic motivation, formal reasoning abilities, and chemical knowledge at submicroscopic level.

Zeyer (2010) investigated the impact of gender and science-orientation on the motivation to learn. The sample was 44 high school students (22 male and 22 female) from upper secondary level in Switzerland. The students were from 17 to 19 years old from science-oriented and non-science-oriented classes. In order to measure motivation to learn science, Science Motivation Questionnaire was used. The questionnaire includes 30 items and it reflects five basic motivational constructs that includes intrinsic and extrinsic motivation, goal orientation, self-determination, self-efficacy, and assessment anxiety. Since the questionnaire was translated and adapted to adolescents, the internal consistency reliability Cronbach's alpha value was calculated and found .872 indicating a high internal consistency. The correlational analysis showed that there was significant difference in motivation to learn science for gender and for science-orientation even if the analysis was restricted to the science students.

James *et al*. (2018) investigated the extent to which extrinsic motivation beliefs predicted academic achievement in chemistry among students in public secondary schools in Kenya. The study was guided by Eccles-Wigfield's Expectancy-Value theory of motivation. Concurrent embedded design was used in the study. Both Stratified random sampling and purposive sampling techniques were used to select 351 form four students, 10 chemistry teachers and 10 guidance and counseling teachers who participated in the study from the 26 sampled schools in Rachuonyo South sub County, Homa Bay County,

Kenya. Questionnaires and interview schedules were used for data collection. Quantitative data was analyzed both descriptively and inferentially while qualitative data was analyzed using thematic analysis.

The finding of the study showed that there was statistically significant, though weak, positive correlation (r=.274, n=308, p<.05) between extrinsic motivation beliefs and chemistry academic achievement and extrinsic motivation accounted for only 7.5% (R Square =.075) of the variation in performance in chemistry in KCSE exams. Based on findings, the study recommended that for the purposes of enhancement of motivational beliefs like extrinsic motivation, school principals should arrange for workshops and seminars for chemistry teachers to help chemistry teachers develop skills which are essential for helping students enhance such motivational beliefs. This is because extrinsic motivation beliefs had positive, though weak relationship with chemistry academic achievement.

2.3.2 Self-efficacy and students' performance in chemistry

Yazachew (2013) investigate relationship between self-efficacy, academic achievement and gender in analytical chemistry at Debre Markos College of teacher education. The self-efficacy survey and the ACI achievement test were completed by 100 students. The self-efficacy survey data were gathered by Likert scale questionnaire. By using inferential statistics (t-test), difference of self-efficacy and achievement in gender is calculated and by using Pearson correlation, the relationships between self-efficacy and achievement were investigated. The analysis of the data indicated that students' level of self-efficacy

is medium (50.08), and there is no significant difference in their self-efficacy between sexes (t (98) = 0.161, p> 0.1), but there is a statistically significant difference in achievement between sexes (t (98) = 0.68, p< 0.1) and also a significant relationship exists between self-efficacy and achievement (r=0.385, at 0.01 level with 98 degree of freedom). Based on these results, recommendations which will improve the quality of our training specifically in the field of chemistry are forwarded.

Richard *et al*. (2012) examined the reciprocal relationship between self-efficacy and performance of instructors via two studies. They used exam performance and a computer-based chemical reactor simulation task exam with multiple-choice, instructors was examined across time in the first study. The results across the tests revealed self-efficacy and performance were positively correlated. Also, previous performance had a positive and significant relationship with subsequent self-efficacy in both tasks within individuals.

Alay and Triantoro (2013) examine the effect of self-efficacy on motivation and performance. They investigated 63 undergraduate students where self-efficacy preparation and performance was assessed over five consecutive exams. In accordance with the majority of self-efficacy studies, they found a significant positive relation between previous performance and self-efficacy. However, at the within-person level of analysis, self-efficacy had a negative relationship with subsequent exam preparation and performance. That is, as self-efficacy increased by a grade, individuals studied 15 minutes less and exam performance decreased by approximately a quarter of a grade.

Omiko (2014) carried out a study on "the construction and validation on a formative achievement test on chemical formulae for senior secondary class three chemistry students" in Gboko Benue State. The researcher administered the validated instrument to

the students. After data analysis of the study, he found out that sex has no significant effect on students' performance.

Ajai and Imoko (2015) sampled gender differences in senior secondary school chemistry performance in Akwa ibom State. Two null hypotheses guided the study. A sample of 380 SS 3 students was used in three different secondary schools for the study. The schools were selected through stratified random sampling. The instrument used was chemistry achievement test (CAT) which was administered to the students. The result revealed a significant gender difference in favor of males. This trend may be attributed to the fact that females regard science subject as intellectually complex and task oriented.

Korso (2013) investigate gender and school type differences in self-efficacy in teaching. Descriptive survey design was used for the study. Respondents were 381 secondary school beginning teachers in East Shoa and West Arsi Zones of Oromiya regional state, Ethiopia. They responded to a two-part questionnaire-demographic variable, and the teachers' sense of efficacy scale. Scale results showed that beginning teachers in Ethiopia claim average levels of self-efficacy, efficacy in student engagement, instructional strategies, classroom management and overall efficacy. However, female beginning teachers in Ethiopia and those teaching in public schools tend to have lower levels of self-efficacy. Implications and recommendations for school practices and future research are discussed.

Waitshega *et al*. (2015) determine the extent of self-efficacy beliefs among final year students in all the teacher training colleges in Botswana, and to determine as to whether there are differences associated with gender, age and college. A total of 598 pre-service teacher trainees completed the quantitative survey. Self-efficacy was measured using the Long Form version of the Teachers' Sense of Efficacy Scale which comprises of 24 items

divided 3-subscales of 8 items each. The self-efficacy score for each student on each subscale was measured using the average score on the 8-items that make up the scale. Analysis of variance was used to investigate if self-efficacy depended on gender, age and college. The findings revealed that the level of self-efficacy was moderated among the trainees, averaging around 3.8 on a scale of 1 to 5. Self-efficacy increased with age for each subscale. Females outperformed males with respect to student engagement, but there were no significant gender differences with respect to instructional strategies and classroom management. There were significant differences between the five colleges with respect to each sub-scale, with one particular college having the lowest mean on all subscales, and another having the highest mean on all subscales. Interestingly the colleges that train primary had higher mean scores than those that train and secondary school teachers. However, further investigations revealed some partial confounding between age and school. The findings suggest that more efforts should be put into empowering pre-service teachers to develop self-confidence in class room management, instructional strategies and student engagement.

Titilayo *et al.* (2016) sought to find out the relationship between chemistry students' self-efficacy and their academic achievement in senior secondary schools in North-central, Nigeria. The study is an ex-post facto research and is a descriptive survey. The subjects of the study were one thousand one hundred and fifty (1150) senior secondary school III chemistry students selected from Kogi, Kwara and Niger States of Nigeria. The data collected were analyzed using descriptive and inferential statistics of mean, percentage and Pearson Product Moment Correlation. The findings revealed that no significant relationship existed between self-efficacy and the academic achievement of the chemistry students. The study concludes that students' self-efficacy needs to be complemented with a host of other factors to achieve high academic achievement in Chemistry. It is therefore

recommended that attention be paid to other factors necessary for better students' achievement in chemistry to complement students' high self-efficacy, so that a combination of these factors could result in high academic achievement in Chemistry.

2.3.3 Study habit and students' performance in chemistry

Olutola and Dosunmu (2016) carried out study on impact of study habit and gender on science achievement of secondary school students in Katsina State. The researchers adopted descriptive survey research design for the study. Two hundred and eighteen (218) senior secondary school students' in Katsina State were randomly selected for the study. A researchers' designed questionnaire titled "Students' Science Achievement Test and Study Habit Questionnaire" (SSATASHQ) with Cronbach's Alpha show a reliability test coefficient of 0.81 was used to collect data for the study. Analysis of data was carried out using regression, t-test and Pearson correlation coefficient statistics at 0.05 alpha level. Findings revealed that there is significant combine relative effect of study habit and gender on science achievement of secondary school students in Katsina State; there is significant difference between gender and students science achievement and there is significant relationship between students' study habit and science achievement. Based on these findings, it was recommended that teachers and parents should assist the students to cultivate effective study habit in other to improve their achievement in science subjects in Nigerian secondary schools. Also, Government should provide reinforcement to motivate the students to improve their study habit.

Orimogunje *et al.* (2010) an investigation was carried out on students' study habit in volumetric analysis at the senior secondary school level in Ondo State. A descriptive research design was adopted in the study. Questionnaire on study habit inventory was adapted and used to collect information from the respondents at various sampled schools. The sample comprised 240 senior secondary II chemistry students drawn from six schools

in Akure South Local Government Area of Ondo State. The hypotheses investigated with respect to students' study habit problems such as home work/ assignment, reading and note-taking, students' concentration, time allocation, teachers' consultation as human variables were analyzed using chi-square statistics at 0.05 level of significance. The results indicated that the main sources of students' study problems have strong influence on students' study habit which is causally related to the performance and consequently the efficiency of the students during the practical lesson in volumetric analysis. Based on the findings of this study, it was recommended that chemistry teachers need proper exposure and orientation to some psychological study problems in order to understand students' developmental and intellectual progress so as to improved learners' performances. Hence, there is a need for workshops and seminar for teachers where the importance of effective study habit behavioural pattern would be stressed.

2.3.4 Gender and students' performance

Yazachew (2013) investigate the level of students' self-efficacy, gender difference in self-efficacy and achievement and also relationships between self-efficacy and achievement for second year students in the fall of 2012 in Analytical Chemistry I (ACI) at Debre Markos College of Teacher Education (DMCTE). The self-efficacy survey and the ACI achievement test were completed by 100 students. The self-efficacy survey data were gathered by likert scale questionnaire. By using inferential statistics (t-test), difference of self-efficacy and achievement in gender is calculated and by using Pearson correlation, the relationships between self-efficacy and achievement were investigated. The analysis of the data indicated that students' level of self-efficacy is medium (50.08), and there is no significant difference in their self-efficacy between sexes ($t(98) = 0.161$, $p > 0.1$), but there is a statistically significant difference in achievement between gender ($t(98) = 0.68$, $p < 0.1$) and also a significant relationship exists between self-efficacy and achievement

(r=0.385, at 0.01 level with 98 degree of freedom). Based on these results, recommendations which will improve the quality of our training specifically in the field of chemistry are forwarded.

Younis and Hemant (2016) carried out study on the academic achievements' and study habits of college students of District Pulwama. The sample for the study was 410 including 193 male and 217 female college students which was further divided into different groups of rural-urban dichotomy. For this purpose descriptive survey method was used. The college students were in the age group of 19 - 21 years. The sample has been selected on the basis of random sampling technique. Palsane and Sharma Study Habits Inventory (PSSHI) and Aggregate marks percentage obtained by the sample subjects in their first and second year examinations were collected from the official records of the colleges. The average of these percentages for each sample subject was used as measure of the academic achievement was administered for the collection of data. The result of the study highlights that there is no significant difference in their study habits. Also the female college students have high academic achievement as compared to male college students. On the other hand it has been found that study habits of college female students are slightly higher than the male.

Joseph *et al.* (2018) carried out investigation on study habits of students: keys to good academic performance in public Junior High Schools in the Ekumfi District of Ghana. The mixed sequential explanatory approach was followed in the conduct of the study where both quantitative and qualitative data were collected and analysed. The multi-stage sampling procedure with the use of proportionate stratified random sampling and convenience sampling techniques were used to select 475 students' even though 380 were correctly filled and therefore used for the study. Structured questionnaire, semi-structured interview guide and checklist were used as instruments for data collection. With the aid

of the Version 20 of the Statistical Product for Service Solution (SPSS), descriptive statistics (mean, standard deviation) and inferential statistical tools such independent sample t-test, one-way ANOVA and Multiple Regression were used to analyze the quantitative data whilst the thematic approach was used to analyze the qualitative data. The findings of the study revealed that study habits significantly accounted for 44% variance in students' academic performance. It further showed that reading and note taking (β=0.605, p=0.000) and time management (β=0.133, p=0.001) made unique significant individual contribution to academic performance whilst the contribution of examination (β=0.011, p=0.830), homework and assignments (β=0.036, p=0.529), and concentration (β=.-.039, p=0.394) did not individually contribute significantly to academic performance. Besides, the study hypothesis disclosed that there is no significant difference in gender and age of student. But significantly occur between impact students' academic performance and study habit. It was recommended that the Ministry of Education and the Ghana Education Service should pay attention to study habits of students so as to heighten academic performance of students in Ekumfi District.

Amandeep and Raj (2015) carried out study to find any significant relationship between study habit and academic achievement amongst college students. A sample of 113 adolescents between 17 to 22 years was selected from college of Home Science, Palampur, they were administered with Study Habit Inventory marks obtained in previously passed out classes which were taken as an indicator of their academic achievements. Analysis of the results suggested significant relationship between study habits and students' academic achievement

2.4 Summary of Literature Reviewed

The reviewed literature conceptualized study habit, self-efficacy and motivation. The stated variables such as study habit, self-efficacy and motivation in teaching and learning

of chemistry. The following theories were discussed in the study; Maslow's motivational theory**.** Empirical studies on the following headings were reviewed; motivation and students' performance in chemistry, self-efficacy and students' performance in chemistry, study habit and students' performance in chemistry. It has been revealed from the related literature reviewed that variable if properly adopted in teaching and learning process of chemistry might improve chemistry performance.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

This study adopted correlational and ex-post facto research design. The choice of correlational design was because it measures a relationship between two variables without the researcher controlling either of the variable. In this study, the correlational research design was used to show the relationship between the data gathered from the sampled opinion of the subjects and chemistry students' academic performance. Also, the used of ex-post facto was because the researcher has no direct manipulation of the dependent variable (performance of the students). The design is considered appropriate since non-casual relationships among the variables which cannot be manipulated are being investigated. The independent variables of the study were motivation, study habit and self-efficacy while dependent variable is students' performance and the moderating variable is gender.

3.2 Population of the Study

The population for this study comprised 3,365 senior secondary school's chemistry students (2019/2020) within Minna, Niger State Ministry of Education (2019). The target population was 1,301 SSS II chemistry students that was selected within the study area. There are 27 senior secondary schools within Minna.

3.3 Sample and Sampling Techniques

Multi stage sampling technique was employed in selecting the sampled students for the study. In the first stage, 27 senior secondary schools were clustered into A and B, three secondary schools were randomly selected from clustered A and two secondary schools were also selected using simple random sampling technique from clustered B, to make it

five secondary schools for the whole study in minna, Niger state. One secondary school was used for pilot study and four secondary schools were used for the main study.

Second stage, SS II chemistry class was randomly selected using simple random sampling technique. Thereafter, 337 SS II chemistry student were randomly selected using simple random sampling techniques. The sample is in accordance with Krejcie and Morgan (1970) sample size determination table. This method gives each member of the population an equal chance of being represented.

Lastly; Non proportionate stratified sampling technique was used to categorize the sample based on gender (male and female) student, the required number were selected from each stratum. In order to achieve a higher degree of precision, the researcher based the selection on proportions. For instance, the number that were selected from each stratum was on the basis of the proportion of the students in all the strata. Table 3.1 show the sampled population from the total population of the study.

Table 3.1: Population distribution of the sampled schools

S/N	School	Population	Gender	Total
1	Bosso Secondary School Minna	70	Male	33
			Female	37
2	DSS Tunga Minna	103	Male	57
			Female	46
3	DSS Chanchaga Minna	89	Male	38
			Female	51
4	Zarumai Model School Minnna	75	Male	41
			Female	34
	Total	**337**		**337**

3.4 Research Instrument

A researcher instrument named ‘Motivation, Study Habit and Self-efficacy Inventory (MOSHSEQ) was used for data collection in this study. (MOSHSEQ) is divided into section A, B, C and D. Section A was used to collect demographic data such as name of the school and gender. Section B of (MOSHSEQ) consisted of 10 items that was used to

collect data on the motivation, while section C consisted of 10 items that was used to collect data on study habit, Section D consisted of 10 items that was used to collect data on students Self -efficacy on performance in chemistry. A five-point Likert scale of Strongly Agree (SA) was awarded 5 points, agree (A) was awarded 4 points, Undecided (U) was awarded 3 points, disagree (D) was awarded 2 points and Strongly Disagree (SD) was awarded 1 point. A grand mean score of 3.0 was used to determine the decision mean to each section of the questionnaire. The performance data was collected by the researcher by going through the randomly sampled schools' examination offices, students promotion examination results was requested for by the researcher and chemistry results of each of the sampled students was extracted out, in order to correlate them with each and every students questionnaires.

3.5 Validation of Research Instrument

To determine whether the research instruments was actually relevant to the constructs to be measured and how related they are to the set criteria, the construct and criterion validity of the instruments was carried out by science education experts at Federal University of Technology, three chemistry experts from colleges of education and secondary schools in Minna. To examine how presentable the research instruments was, and its appropriateness, suitability for target population in terms of clarity, depth of coverage and language; that is whether its statements were simple and unambiguous, the face and content validity of the research instruments were carried out by one expert in guidance and counselling, experts with good background in psychology at the Department of General Studies, Federal University of Technology, Minna, Niger State. Vital inputs that were made by all the experts, their suggestions and corrections were effected by the researcher and so that the research instruments were finally found fit for the research.

3.6 Reliability of the Instruments

The reliability of the research instruments was determined after conducting a pilot study on 103 students at Day Secondary school Limawa Minna, who were among the population, but not part of the sample for the main study. The researcher carefully administered the instruments once on the respondents and the data obtained were analyzed using Cronbach Alpha. A reliability computation on (motivation) showed 0.89 alpha levels, (Study habit) showed 0.87 and (Self-Efficacy) showed 0.91 Cronbach alpha level respectively.

3.7 Method of Data Collection

An introductory letter was collected by the researcher from science education department, Federal University of Technology, Minna. The researcher presented the letter to the appropriate authorities in the sampled secondary school in Minna, in order to seek their permission to have access to the school for the research. Once the permission was granted, four persons were trained as research assistants by the researcher on the rudiments of data collection as regarding this study. Then, the researcher randomly selects the required number of students needed for the study. All the respondents were briefed on the objectives of the study and how to fill the questionnaires to ensure that valid data were collected. Thereafter, the researcher and trained research assistants administered the questionnaires on all the respondents. In order to ensure compliance and complete return of all the copies of instruments that were administered, the researcher and the research assistants waited for the period of administration of instrument and ensure retrieval of the completed questionnaires. The filled and completed copies of the questionnaires were collected by the researcher.

3.8 Method of Data Analyses

The data collected from the sampled students were analyzed using descriptive and inferential statistics. All the Seven research questions were answered using descriptive statistics of mean and standard deviation. Grand mean of 3.0 was adjudged as agree and below 3.0 was disagree. Linear regression and ANOVA; were used to test hypotheses one, three and five. Kendall's tau_b; was used to answer hypotheses two, four and five. Multiple regression and ANOVA; was used to answer hypotheses seven. The significant relationship was ascertained at 0.05 alpha levels. The Statistical Package for Social Science (SPSS) version 23.0 was used for the analysis

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Answer to Research Question

Research Question One:

What is the influence of study habit on performance of senior secondary school students in chemistry? The research question was answered using descriptive statistic of Mean and Standard Deviation, the summary of the result is presented in Table 4.1

Table 4.1: Mean and Standard Deviation of student's performance and study habit

Variable	N	$\overline{X}$	SD	$\overline{X}$ difference
Performance	337	49.73	12.02	
				1.36
Study Habit	337	48.37	12.55	

Table 4.1 shows that mean and standard deviation of student's performance and study habit. The findings show computed mean score of 49.73 with Standard Deviation of 12.02 for student's performance and Mean score of 48.37 with standard Deviation of 12.55 for study habit. This gives Mean difference of 1.36 between their performance and study habit. The finding is highlighted using a scattered plot in Figure 4.1

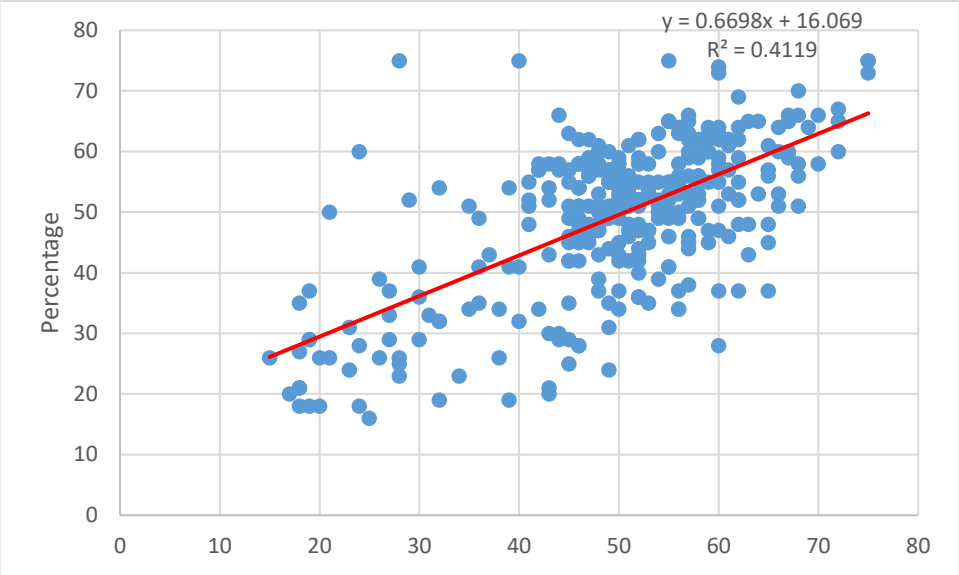

Figure 4.1 Scattered plot of the relationship between student's performance and study habit

Figure 4.1 is a scattered plot of the relationship between student's performance and study habit. The scattered plot indicates that there seems to be a positive relationship between the two construct. The trend line shows that as study habit increases, students' performance also increases. Therefore, linear regression will be used to determine the strength of the relationship.

Research Questions Two:

What is the influence of gender on senior secondary school students' performance in chemistry? This research question is answered using descriptive statistic of Mean and Standard Deviation, the summary of the result is presented in Table 4.2

Table 4.2: Mean, Standard Deviation and Mean Difference of gender and senior secondary school performance in chemistry

Variable	N	$\bar{X}$	SD	$\bar{X}$ difference
Performance	337	49.73	12.03	
				48.23
Gender	337	1.50	.5007	

Table 4.2 shows the mean and standard deviation of gender and senior secondary school performance in chemistry. The findings show computed Mean score of 49.73 with

Standard Deviation of 12.03 for senior secondary school students' performance in chemistry and Mean score of 1.50 with standard Deviation of 0.50 for gender, this gives mean difference of 48.23. The relationship between performance and gender is illustrated in Figure 4.2

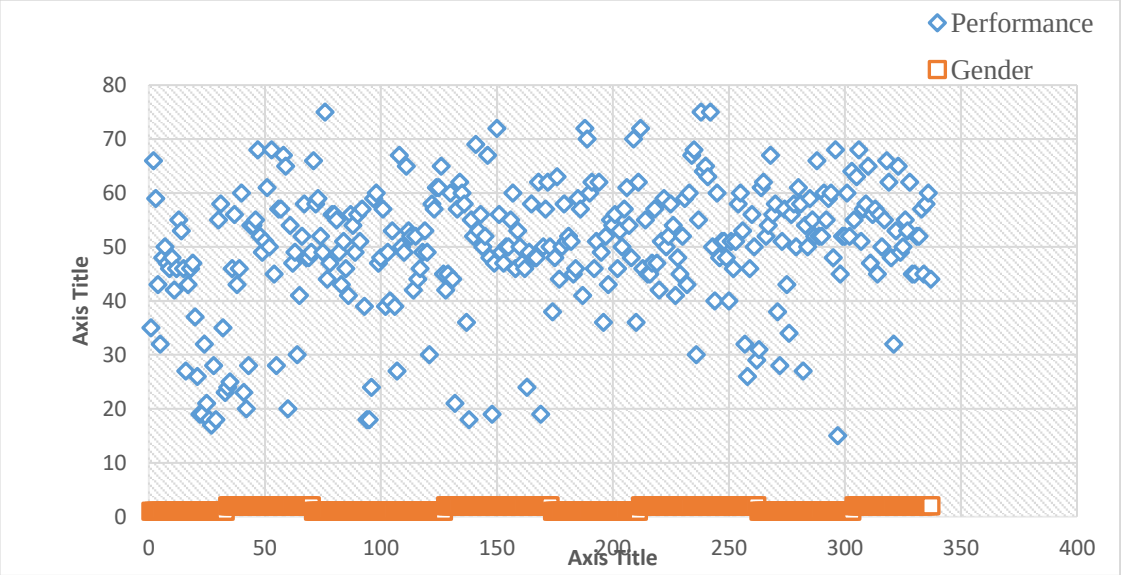

Figure 4.2 Scattered Plot of the Relationship between Student's Performance and Gender

Figure 4.2: is a scattered plot of the relationship between student's performance and gender. The scattered plot indicates that there seems to be a negative relationship between the two construct. Therefore, linear regression will be used to determine the strength of the relationship.

Research Questions Three

Does self-efficacy influence senior secondary school students' performance in chemistry?

This research question is answered using descriptive statistic of Mean and standard deviation, the summary of the result is presented in Table 4.3

Table 4.3: Mean, Standard Deviation and mean difference of self-efficacy and senior secondary school performance in chemistry

Variable	N	$\bar{X}$	SD	$\bar{X}$ difference
Performance	337	49.73	12.02	
				14.99
Self-efficacy	337	34.74	9.17	

Table 4.3 shows that mean and standard deviation self-efficacy and senior secondary school performance in chemistry. The findings show the computed mean score of 49.73 with Standard Deviation of 12.02 for senior secondary school performance in chemistry and Mean score of 34.74 with standard Deviation of 9.17 for self-efficacy. This gives Mean difference of 14.99. The graphical illustration of the relationship is presented in Figure 4.3

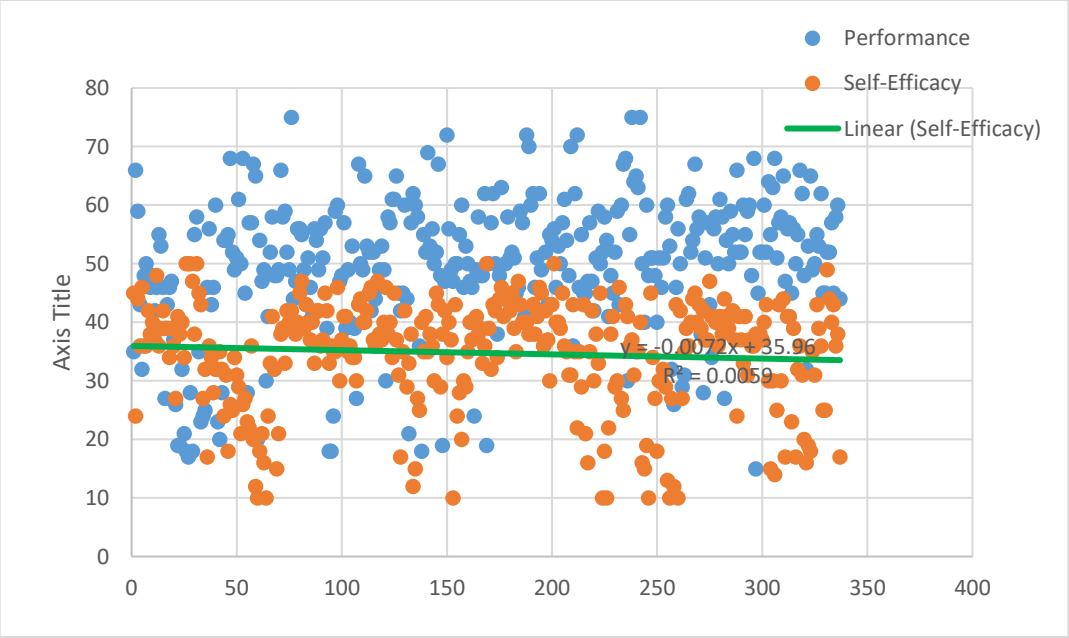

Figure 4.3 scattered plot of the relationship between student's performance and self-efficacy

Figure 4.3 is a scattered plot of the relationship between student's performance and self-efficacy. The scattered plot indicates that there seems to be a weak relationship between the two construct. Therefore, linear regression will be used to determine the strength of the relationship.

Research Question Four:

Examine the relationship between self-efficacy, gender and senior secondary school performance in chemistry? This research question is answered using descriptive statistic of Mean and Standard Deviation, the summary of the result is presented in Table 4.4

Table 4.4: Mean and Standard Deviation of self-efficacy, gender and senior secondary school performance in chemistry

Variable	N	$\bar{X}$	SD
Performance	337	49.73	12.02
Self-Efficacy	337	34.74	9.17
Gender	337	1.50	.50

Table 4.4 shows the mean and standard deviation of self-efficacy, gender and senior secondary school performance in chemistry. The findings indicate the computed Mean score of 49.73 with Standard Deviation of 12.02 for senior secondary school performance in chemistry and Mean score of 35.896 with standard Deviation of 9.6753 for self-efficacy and Mean score of 1.50 with standard Deviation of 0.50 for gender. Graphical output of the relationship between these constructs are illustrated in figure 4.4

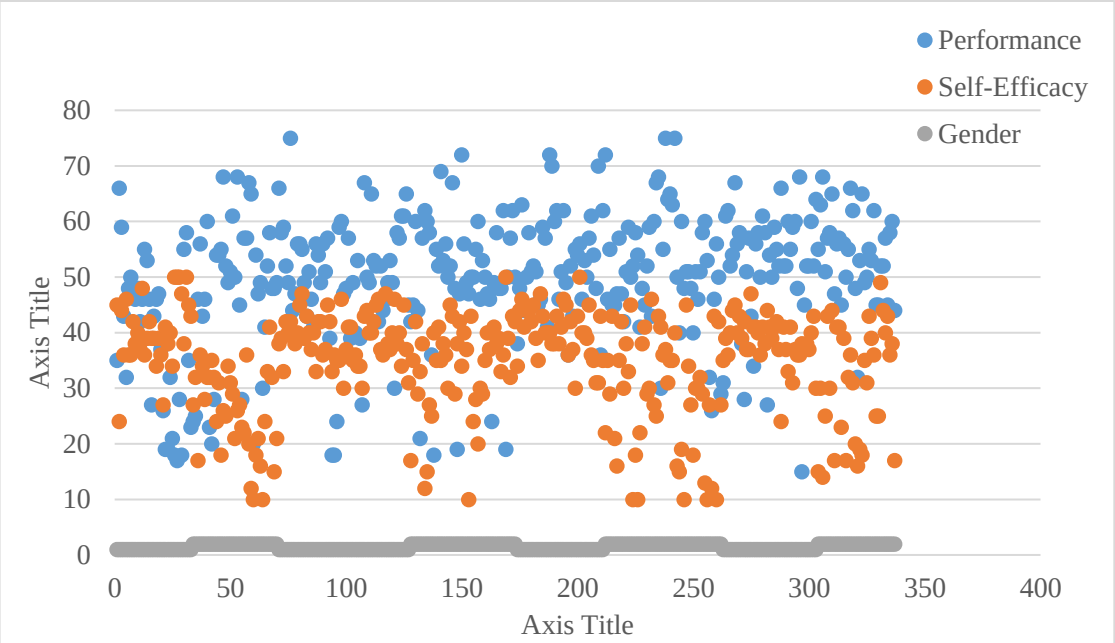

Figure 4.4: Scattered plot of the relationship between student's performance, self-efficacy and gender

Figure 4.4 is a scattered plot of the relationship between student's performance, self-efficacy and gender. The scattered plot indicates that there seems to be a weak relationship between the three constructs. Therefore, linear regression will be used to determine the strength of the relationship.

Research Question Five:

Compare the relationship between students' motivation and senior secondary school performance in chemistry. This research question is answered using descriptive statistic of Mean and Standard Deviation, the summary of the result is presented in Table 4.5

Table 4.5: Mean, Standard Deviation and mean difference of students' motivation and senior secondary school performance in chemistry

Variable	N	$\bar{X}$	SD	$\bar{X}$ difference
Performance	337	49.73	12.02	
				1.48
Motivation	337	48.25	12.25	

Table 4.5 shows the mean and standard deviation gender and senior secondary school performance in chemistry? The findings show the computed mean score of 49.73 with Standard Deviation of 12.02 for senior secondary school performance in chemistry and mean score of 48.25 with standard deviation of 12.25 for mean. This gives mean difference of 1.48 between their performance and motivation.

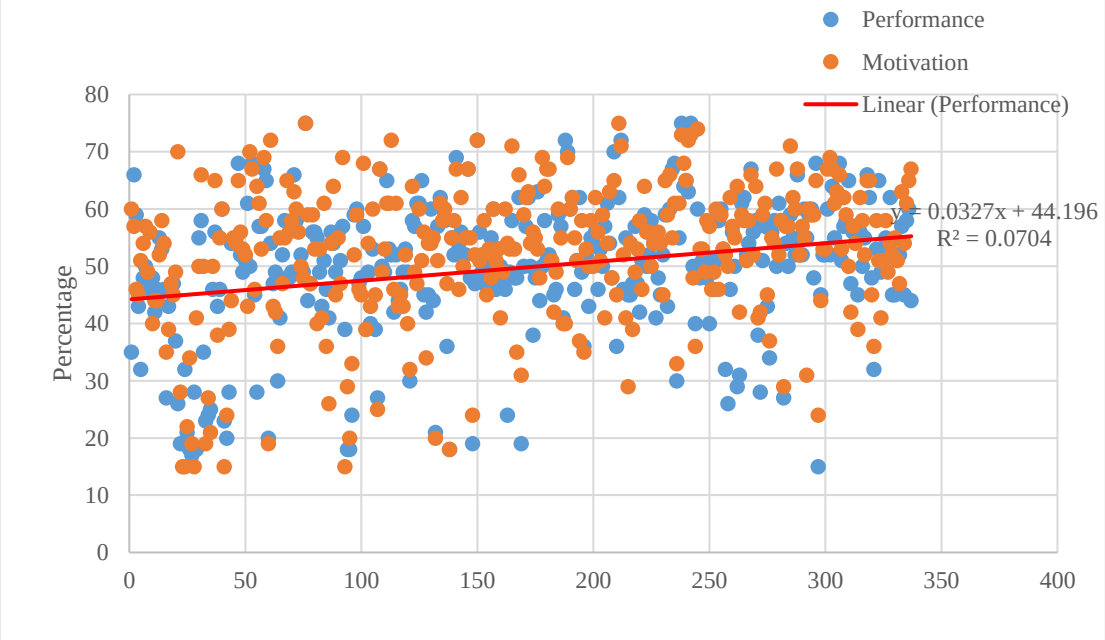

Figure 4.5: Scattered plot of the relationship between student's motivation and performance.

Figure 4.5 is a scattered plot of the relationship between student's motivation and performance. The scattered plot indicates that there seems to be a positive relationship between the two constructs. The trend line indicates that increase in students' motivation will cause an increase in students' performance. Therefore, linear regression will be used to determine the strength of the relationship between performance and motivation.

Research Question Six:

What is the relationship between motivation, gender and senior secondary school performance in chemistry? This research question is answered using descriptive statistic of Mean and Standard Deviation, the summary of the result is presented in Table 4.6

Table 4.6: Mean, Standard Deviation and mean difference of motivation, gender and senior secondary school performance in chemistry

Variable	N	$\bar{X}$	SD
Performance	337	49.73	12.02
Motivation	377	48.25	12.25
Gender	337	1.50	.50

Table 4.6 shows the mean and standard deviation of gender and senior secondary school performance in chemistry? The findings show the computed Mean score of 49.73 with Standard Deviation of 12.02 for senior secondary school performance in chemistry and Mean score of 48.25 with standard Deviation of 12.25 for motivation, while the mean score of 1.50 with standard Deviation of 0.50 for gender.

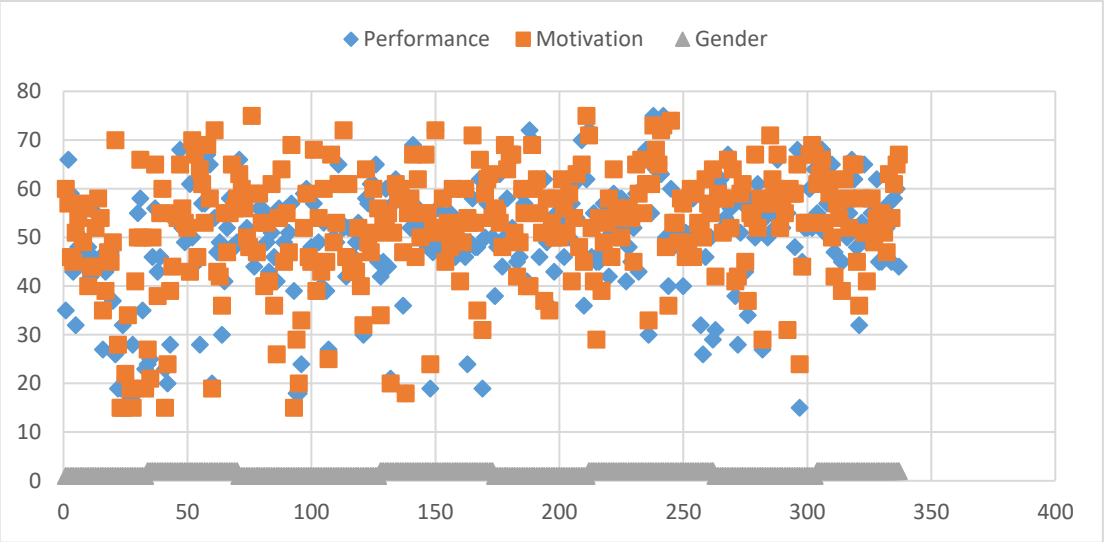

Figure 4.6 scattered plot of the relationship between student's motivation, gender and performance

Figure 4.6 is a scattered plot of the relationship between student's motivation, gender and performance. The scattered plot indicates that there seems to be a week relationship between performance, motivation and gender. However, positive relationship seems to exist between performance and gender. Therefore, linear regression will be used to determine the strength of the relationship between performance and motivation.

Research Questions Seven:

Is there any relationship between self-efficacy, study habit, motivation on senior secondary school performance in chemistry? This research question answered using descriptive statistic of mean and standard deviation, the summary of the result is presented in Table 4.7

Table 4.7: Mean, Standard Deviation and mean difference of self-efficacy and study habit and motivation on senior secondary school performance in chemistry

Variable	N	$\bar{X}$	SD
Performance	337	49.73	12.02
Study Habit	337	48.37	12.25
Self-efficacy	337	34.74	9.17
Motivation	337	48.25	12.25

Table 4.7 shows the mean and standard deviation of gender and senior secondary school performance in chemistry? The findings show the computed Mean score of 49.73 with Standard Deviation of 12.02 for senior secondary school performance in chemistry, mean score of 48.37 with standard deviation of 12.25 for study habit. Similarly, the mean score of 34.74 with standard deviation of 9.17 for self- efficacy, while the mean and standard deviation of the students' motivation shows 48.25 and 12.25 respectively. The relationship between these constructs are illustrated in figure 4.7

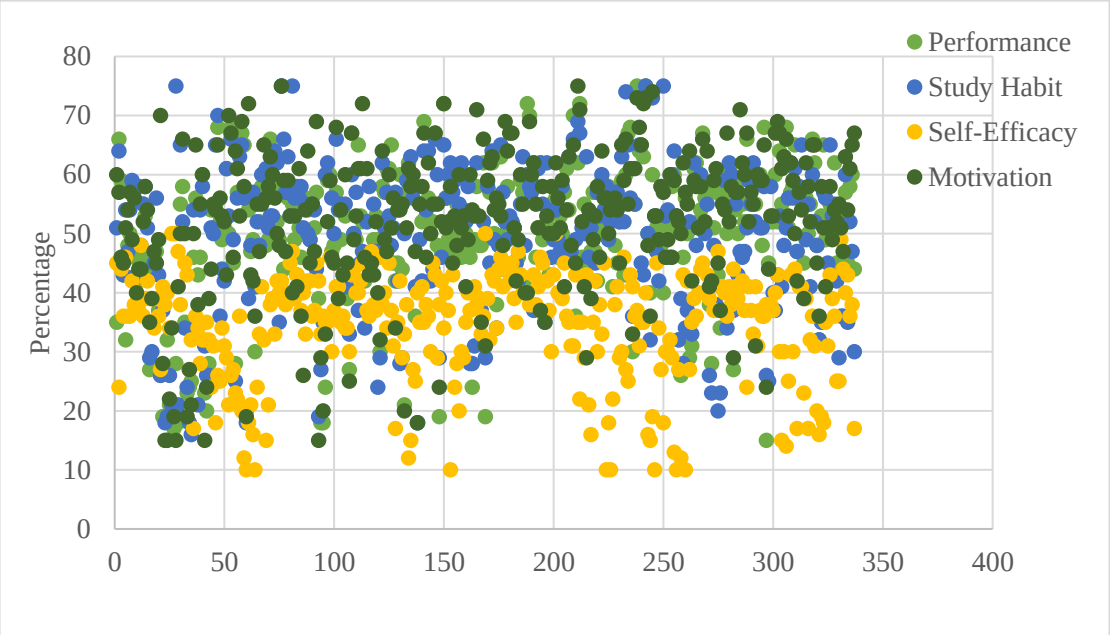

Figure 4.7: Scattered plot of the relationship between student's performance, study habit, self-efficacy and motivation

Figure 4.7 is a scattered plot of the relationship between student's performance, study habit, self-efficacy and motivation. The scattered plot indicates that there seems to be a relationship between the predictors and the criterion variable. Therefore, multiple regressions will be used to determine the strength of the relationship between performance and motivation.

4.2 Testing of Hypotheses

Hypotheses One (HO_1): There is no significant relationship between student study habit and senior secondary school performance in chemistry.

This formulated hypothesis was tested using linear regression and the summary of the results is presented in Table 4.8

Table 4.8: Linear Regression Model Summary on the Influence of student's Study Habit on senior secondary school performance in chemistry.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.642[a]	.412	.410	9.23592

a. Predictors: (Constant), Study Habit

Table 4.8 shows the regression coefficient for the independent variable; Study habit. The result shows r (1,355) = .642, r^2 = .41. Indicating that 41% of the total variation in senior secondary school students' performance in chemistry can be attributed to the students' study habit. To determine whether the model was a good predictor, ANOVA result was presented Table 4.8.1

Table 4.8.1: Regression ANOVA on student Study habit and senior secondary school performance in chemistry

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20012.154	1	20012.154	234.603	.000[b]
	Residual	28576.274	335	85.302		
	Total	48588.427	336			

a. Dependent Variable: Performance

b. b. Predictors: (Constant), Study Habit

Table 4.8.1 display ANOVA results. The findings show that there is a significant difference between the predictor (student's habit) and the criterion variables (senior

secondary school performance in chemistry) F (1,335) = 234.60, p (0.00) < 0.05. Indicating that the model is a good predictor of the relationship between students' study habit and performance Yaki *et al*. (2021).

Table 4.8.2: Linear Regression Coefficient between student Study habit and senior secondary school performance in chemistry

Model		Unstandardized Coefficients		Standardized Coefficients	t-cal	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.366	2.045		9.469	.000
	Study Habit	.615	.040	.642	15.317	.000

Dependent Variable: Performance

Table 4.8.2 shows the regression coefficient between student study habit and senior secondary school performance in chemistry. The result shows that student habit is a significant predictor of students' performance in chemistry (B = .642, t = 15.32, p (0.00) < 0.05). The regression coefficient indicates that for any increase in one unit of student's habit will cause an increase in .615units of senior secondary school students' performance in chemistry.

HO_2: There is no significant relationship between gender and senior secondary school performance in chemistry.

This formulated hypothesis was tested using Kendall's tau_b correlation relationship and the summary of the results is presented in Table 4.9

Table 4.9: Kendall's tau_b correlation relationship between gender and senior secondary school performance in chemistry

			Gender	Performance
Kendall's tau_b	Gender	Correlation Coefficient	1.000	.047
		Sig. (2-tailed)	.	.298
		N	337	337
	Performance	Correlation Coefficient	.047	1.000
		Sig. (2-tailed)	.298	.
		N	337	337

Table 4.9 revealed that there is no significant relationship between gender and senior secondary school performance in chemistry. The results show r = 0.47, p-value = 0.298, which means p> 0.05, the null hypothesis which states that There is no significant relationship between gender and senior secondary school performance in chemistry is not rejected. The correlation coefficient (r = 0.47) further shows that there is a positive relationship between gender and senior secondary school performance in chemistry. However, gender has no significant correlation on students' performance in chemistry.

HO_3: There is no significant relationship between self-efficacy and senior secondary school performance in chemistry. This formulated hypothesis was tested using linear regression and the summary of the results is presented in Table 4.10

Table 4.10: Linear Regression Model Summary on Influence of Self-efficacy on students' performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.037[a]	.001	-.002	12.03492

Predictors: (Constant), Self-efficacy

Table 4.10 shows the regression coefficient for the independent variable self-efficacy. The result shows r (1,335) = .037, r^2 = -0.002. Indicating that 0% of the total variation of self-efficacy on senior secondary school students' performance in chemistry. To determine whether the model was a good predictor, ANOVA result was presented Table 4.10.1

Table 4.10.1: Regression ANOVA on Students' Self-efficacy and Performance in Chemistry

Model		Sum of Squares	df	Mean Square	f-cal	Sig.
1	Regression	67.252	1	67.252	.464	.496[b]
	Residual	48521.175	335	144.839		
	Total	48588.427	336			

Dependent Variable: Performance

Predictors: (Constant), Self-efficacy

Table 4.10.1 display ANOVA results. The findings shows that there is no significant difference between the predictor (self-efficacy) and the criterion variables (senior secondary school performance in chemistry) f(1,335) =.464, p (0.50) > 0.05. Indicating that the model is not a good predictor of the relationship between self-efficacy than the mean.

Table 4.10.2: Linear Regression Coefficient between Students' Self-efficacy and Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t-cal	Sig.
		B	Std. Error	Beta		
1	(Constant)	51.424	2.571		20.005	.000
	Self-efficacy	-.049	.072	-.037	-.681	.496

Dependent Variable: Performance

Table 4.10.2 shows the regression coefficient between self-efficacy and senior secondary school performance in chemistry. The result shows that self-efficacy is not a significant predictor of the senior secondary school performance chemistry (B = -.037, t = -.68, p (0.50) > 0.05). The regression coefficient indicates that any increase in self-efficacy will not cause any increase in senior secondary school performance in chemistry.

HO_4: There is no significant relationship between gender and self-efficacy among senior secondary school students in chemistry. This formulated hypothesis was tested using Kendall's tau_b correlation relationship and the summary of the results is presented in Table 4.11

Table 4.11: Kendall's tau_b correlation relationship between self-efficacy, gender and senior secondary school performance in chemistry

			Gender	Self_Efficacy
Kendall's tau_b	Gender	Correlation Coefficient	1.000	-.412**
		Sig. (2-tailed)	.	.000
		N	337	337
	Self_Efficacy	Correlation Coefficient	-.412**	1.000
		Sig. (2-tailed)	.000	.
		N	337	337

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.11 revealed that there is a significant relationship between self-efficacy, gender and senior secondary school performance in chemistry. The results show r = -0.412, p-value = 0.00, which means p< 0.05, the null hypothesis which states that There is no significant relationship between self-efficacy, and gender among senior secondary school students was rejected. The correlation coefficient (r = -0.412) further shows that there is a negative relationship between gender and self-efficacy of secondary school students' performance. Hence, gender has significant influence on self-efficacy of students' on performance in chemistry.

HO_5: There is no significant relationship between students' motivation and senior secondary school performance in chemistry. This formulated hypothesis was tested using linear regression and the summary of the results is presented in Table 4.12

Table 4.12: Linear Regression Model Summary on Influence of Students' motivation on Students' Performance in Chemistry

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.719[a]	.517	.515	8.37320

a. Predictors: (Constant), Motivation

Table 4.12 shows the regression coefficient for the independent variable motivation and gender on senior secondary school performance in chemistry. The result shows r (1,335)

= .719, r^2 = .517. Indicating that 51.7%% of the total variation of senior secondary school students' performance in chemistry. To determine whether the model was a good predictor, ANOVA result was presented Table 4.12

Table 4.12.1: Regression ANOVA between students' motivation and senior secondary school performance in chemistry

Model		Sum of Squares	df	Mean Square	f-cal	Sig.
1	Regression	25101.420	1	25101.420	358.027	.000[b]
	Residual	23487.008	335	70.110		
	Total	48588.427	336			

a. Dependent Variable: Performance

b. b. Predictors: (Constant), Motivation

Table 4.12.1 display ANOVA results. The findings shows that there is a significant difference between the predictor (motivation) and the criterion variables (senior secondary school performance in chemistry) F (1,335) = 358.02, p (0.00) < 0.05. Indicating that the model is a good predictor of the relationship between motivation and performance than the mean.

Table 4.12.2: Linear Regression Coefficient of Students' Motivation and Performance in Chemistry

Model		Unstandardized Coefficients		Standardized Coefficients	t-cal	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.082	1.990		6.574	.000
	Motivation	.705	.037	.719	18.922	.000

. Dependent Variable: Performance

Table 4.12.2 shows the regression coefficient between motivation and senior secondary school students' performance in chemistry. The result shows that student study habit is a significant predictor of senior secondary school students' performance in chemistry (B = .719, t = 18.92, p (0.00) < 0.05). The regression coefficient indicates that for any increase

in one unit of motivation will cause an increase in .705 units of senior secondary school performance in chemistry, holding other variables constant.

HO_6: There is no significant relationship between gender and motivation among senior secondary school students. This formulated hypothesis was tested using Kendall's tau_b correlation relationship and the summary of the results is presented in Table 4.13

Table 4.13: Kendall's tau_b correlation relationship between motivation, gender and senior secondary school performance in chemistry

			Gender	Motivation
Kendall's tau_b	Gender	Correlation Coefficient	1.000	.076
		Sig. (2-tailed)	.	.092
		N	337	337
	Motivation	Correlation Coefficient	.076	1.000
		Sig. (2-tailed)	.092	.
		N	337	337

Table 4.13 revealed that there is no significant relationship between motivation, gender and senior secondary school performance in chemistry. The results show r = 0.076, p-value = 0.092, which means p> 0.05, the null hypothesis which states that There is no significant relationship between motivation and gender of senior secondary school school students is not rejected. The correlation coefficient (r = 0.092) further shows that there is a positive relationship between gender and motivation among senior secondary school students

HO_7: There is no significant relationship between self-efficacy, study habit, motivation on senior secondary school performance in chemistry. However, gender has no significant relationship. To test this hypothesis multiple regression was employed and the analysis is presented in Table 4.14

Table 4.14: Multiple Regression Model Summary Showing the Influence of Motivation, Self-Efficacy and Study Habit on Performance of senior secondary school performance in chemistry

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.794[a]	.630	.627	7.34644

a. Predictors: (Constant), Motivation, Self-Efficacy, Study Habit

Table4.14 shows the regression coefficient for the independent variable motivation, self-efficacy and study habit on senior secondary school performance in chemistry. The result shows r(3,333) = .794, r^2 = .630. Indicating that 63%% of the total variation of senior secondary school students' performance in chemistry was accounted by the predictor variables (motivation, self-efficacy and study habit). To determine whether the model was a good predictor, ANOVA result was presented Table 4.14.1

Table 4.14.1: Regression ANOVA of the student habit, motivation and self-efficacy on senior secondary school performance in chemistry

Model	Sum of Squares	df	Mean Square	f-cal	Sig.
Regression	30616.348	3	10205.449	189.09	.000[b]
Residual	17972.079	333	53.970		
Total	48588.427	336			

a. Dependent Variable: Performance

b. Predictors: (Constant), Motivation, Self-Efficacy, Study Habit

Table 4.14.1 display multiple regression results. The findings show that significant relationship between the predictor (self-efficacy, study habit and motivation) and the criterion variables (senior secondary school performance in chemistry) *F* (1,333) =189.09, p (0.00) < 0.05. Indicating that the model is a good predictor of the relationship between self-efficacy, study habit and motivation and performance than the mean.

Table 4.14.2: Multiple Regression Model Summary Showing the study habit, self-efficacy, motivation and performance.

Model		Unstandardized Coefficients		Standardized Coefficients	t-cal	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.045	2.569		1.185	.237
	Study-Habit	.369	.037	.385	10.098	.000
	Self-Efficacy	.035	.044	.027	.806	.421
	Motivation	.524	.037	.534	14.016	.000

Dependent Variable: Performance

Table 4.14.2 shows the regression coefficient between motivation and senior secondary school students' performance in chemistry. The result shows that student study habit is a significant predictor of senior secondary school students' performance in chemistry (B = .534, t = 14.016, p (0.00 < 0.05). The regression coefficient indicates that for any increase in one unit of study habit, self-efficacy and motivation will cause an increase in .954 units of senior secondary school performance in chemistry, holding other variables constant.

4.3 Summary of the Findings

1 There was significant relationship between student study habit and senior secondary school performance in chemistry.

2 There was no significant relationship between gender and senior secondary school performance in chemistry.

3 There was no significant relationship between self-efficacy and senior secondary school performance in chemistry

4 There was no significant relationship between self-efficacy, gender and senior secondary school performance in chemistry

5 There was significant relationship between students' motivation and senior secondary school performance in chemistry

6 There was significant relationship between motivation, gender and senior secondary school performance in chemistry

7 There was significant relationship between self-efficacy, study habit, motivation and senior secondary school performance in chemistry

4.4 Discussion of the Findings

There was significant influence of student study habit on senior secondary school students' performance in chemistry. This support the findings of Joseph, Kweku and Robert (2018), that carried out investigation on study habits of students: keys to good academic performance in public junior high schools. The findings of the study revealed that study habits significantly accounted for 44% variance in students' academic performance. This is in contrary to the findings of Younis and Hemant (2016), who investigated the academic achievements' and study habits of college students. The result of the study highlights that there is no significant difference in their study habits.

There was no significant influence of gender on senior secondary school students' performance in chemistry. This is in agreement with the findings of Omiko (2014), who carried out a study on "the construction and validation on a formative achievement test on chemical formulae for senior secondary class three chemistry students. The researcher administered the validated instrument to the students. After data analysis of the study, he found out that sex has no significant effect on students' performance. Also disagreement with the findings of Ajai and Imoko (2015) sampled gender differences in senior secondary school chemistry performance. The result revealed a significant gender difference in favour of males. This trend may be attributed to the fact that females regard science subject as intellectually complex and task oriented.

There was no significant influence of self-efficacy and senior secondary school performance in chemistry. This is contrary to the study of Richard *et al.* (2012), who examined the reciprocal relationship between self-efficacy and performance of instructors via two studies. Also disagree with the findings of Yazachew (2013), who investigated relationship between self-efficacy, academic performance and gender in analytical chemistry. The results revealed significant relationship exists between self-efficacy and performance

There was no significant relationship between self-efficacy, gender on senior secondary school students' performance in chemistry. This oppose to the findings of Korso (2013), who investigate gender and school type differences in self-efficacy in teaching. The results show female tend to have lower levels of self-efficacy.

There was significant relationship between students' motivation on senior secondary school students' performance in chemistry. This is in support of the finding of Vrtacnik *et al*. (2010), who investigated the relationship between high school students' motivational profiles and chemistry achievement. The results showed that students' motivational profiles were very important for their academic achievement. Students from good quality motivation group had greater achievements in chemistry lessons than the students from bad quality motivation group. Also concurred with the findings of Guluzar and Omer (2011), who carried out the study on the relationship between academic achievement and motivation pre-service chemistry teachers. The results indicated that there is only one significant relationship that is between academic achievement and two intrinsic motivation subscales (to know and to experience stimulation).

There was significant relationship between motivations, gender on senior secondary school students' performance in chemistry. This in agreement with the study of Guluzar

and Omer (2011) carried out the study on the relationship between academic performance and motivation pre-service chemistry teachers. The results show only significant differences between males and females for intrinsic motivation to experience stimulation. Also, in support of findings of Zeyer (2010), who investigated the impact of gender and science-orientation on the motivation to learn. The correlational analysis showed that there was significant difference in motivation to learn science for gender and for science-orientation even if the analysis was restricted to the science students.

There was significant relationship between self-efficacy, study habit, motivation and senior secondary school students' performance in chemistry. This agrees with the findings of Alay and Triantoro (2013), who examine the effect of self-efficacy on motivation and performance. The study found a significant positive relation between previous performance and self-efficacy.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study disclosed that study habits, motivation and self-efficacy impacted positively on students' academic performance accordingly.

5.2 Recommendations

1. It was recommended that chemistry teachers should adopt measures to strengthen students' motivation, self-efficacy and study habit to boost their academic performance in chemistry.
2. Students should be reoriented to improve study habits in relation to time allocation for personal reading and assignment, since these are crucial aspects of schooling.
3. Stakeholder as matter of urgent should organize orientation to new chemistry students on how to develop good study habit and self-efficacy in order to enhance their performance in chemistry.
4. Curriculum planner should incorporate contents related to students' study habits and self-efficacy into their curriculum, in order to improved academic performance of students in chemistry.

5.3 Contribution to Knowledge

1. The findings in this study showed that motivation, self-efficacy, and study habit have significant influence on student performance in chemistry.
2. The findings from this study have added to knowledge in the sense that it can serve as a source of literature for researchers in the field of chemistry education.

5.4 Limitations of the Study

The following are challenges regarding the study

This study was carried out in Minna, Niger State.

1. The researcher experienced some challenges in filling the questionnaire items due to the knowledge of the students as it takes time in translating the items to their understanding.
2. The constraint of time has limited the work to a sample size of 337 senior secondary schools in the whole of Niger State.
3. The researcher was confronted with the difficulty to access data from the Ministry of Education due to the secrecy attached to official documents. Therefore, the researcher made use of the only available data at the time of the study.

5.5 Suggestions for Further Study

1. This study could be replicated in North-Central, Nigeria so as to be able to give room for generalization.
2. Similar study should be carried out in other subjects like physics, biology and mathematics

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APPENDIX A

QUESTIONNAIRE

Department of Science Education

School of Science and Technology

Federal University of Technology,

Minna,

LETTER OF INTRODUCTION

I am postgraduate student of the above department carrying out a research on ‘’study habit, motivation and self-efficacy as determinant’s of performance in chemistry among the senior secondary school in Minna, Niger state’’. Please kindly read carefully and fill the questionnaire by ticking ( ) the option provided in the table that best described your opinion. The information you provided would be treated with utmost confidentiality for the purpose of this study.

Thank you in anticipation for your cooperation.

SECTION B: BIO-DATA INFORMATION

Name of School: ……

Gender Male ( ) Female( )

SECTION B:

The following questions were formed based on the objectives of the study and Likert scaling is used for the degree of responses SA = Strongly Agree, A = Agree, D = Disagree, SD = strongly Disagree

MOTIVATION

S/N	STATEMENT	SA	A	U	D	SD
1.	In Chemistry class, I prefer course material that really challenges me so I can learn new things.					
2	When my performance is poor compared with other students in Chemistry it motivate me to study hard.					
3	I will be able to apply what I learn in the Chemistry in other courses.					
4	I believe I will receive an excellent grade in Chemistry.					
5	Getting a good grade in Chemistry is the most satisfying thing for me right now.					
6	I prefer topic on Chemistry that arouses my curiosity even if it is difficult to learn.					
7	I like the subject matter of this Chemistry course.					
8	Assignment and test motivates me to do excellently well in Chemistry course.					
9	Teacher motivate me to perform well in Chemistry class.					
10	My performances in chemistry enhance my performance in other science subjects.					

STUDY HABIT

S/N	STATEMENT	SA	A	U	D	SD
1.	When I study Chemistry topics, I outline the material to help me organize my thoughts.					
2.	During Chemistry class I often miss important points because I am thinking of other things.					
3.	When studying, I often try to explain the material to classmate or friends.					
4.	I usually study Chemistry topic in peace where I can concentrate on my class work.					
5.	When reading for Chemistry course, I make up questions to help focus my reading.					
6.	I either give up or only study the easy parts, when course work is difficult.					
7.	I memorize key words to remind me of important concept in Chemistry class.					
8.	When study for Chemistry class, I pull together information from difference sources, such as teachers reading and discussions.					
9.	I ask myself questions to make sure I understand the material I have been studying in the Chemistry class.					
10.	When I study for Chemistry course, I go over my class note and make an outline of important concept					

SELF-EFFICACY

S/N	STATEMENT	SA	A	U	D	SD
1.	I believe I will receive an excellent grade in Chemistry class.					
2.	I am certain I can understand the most difficult topics in Chemistry					
3.	I am confident I can understand the most complex topic presented by the Chemistry teacher.					
4.	I am confident I can do an excellent job on the assignment and test in Chemistry class.					
5.	Despite the wideness of Chemistry as a subject, I can still exhibit better skill in the chemistry class.					
6.	I like explaining difficult topics in chemistry to other students					
7.	If I practiced every day, I can develop my pedagogy skill in chemistry					
8.	I believe I can study Chemistry when there other interesting thing to do?					
9.	I could perform Chemistry task set by the teachers?					
10.	I can change my basic level of academic abilities considerably through Chemistry					

APPENDIX B

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Reliability

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Scale: ALL VARIABLES

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Reliability Statistics

Cronbach's Alpha	N of Items
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Reliability

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Scale: ALL VARIABLES

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Reliability Statistics

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Reliability

[DataSet3]

Scale: ALL VARIABLES

Case Processing Summary

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	Total	103	100.0

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Reliability Statistics

Cronbach's Alpha	N of Items
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APPENDIX C

Schools Used for Pilot and the main Study

S/N	School	
1	Bosso Secondary School	Main study
2	Zarumai Model Minna	Main study
3	Day Secondary School Tunga	Main study
4	Day Secondary School Chanchaga	Main study
5	Day Secondary School Limawa, Minna	Pilot study