RELATIONSHIP AMONG ACADEMIC SELF-EFFICACY, COGNITIVE ENGAGEMENT AND ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN KADUNA STATE, NIGERIA

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DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND COUNSELLING

FACULTY OF EDUCATION,
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MAY, 2018

DECLARATION

I declare that the work in this thesis entitled; Relationship among Academic Self-Efficacy, Cognitive Engagement and Academic Achievement of Senior Secondary School Students in Kaduna State, Nigeria, has been carried out by me in the Department of Educational Psychology and Counselling Ahmadu Bello University, Zaria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

_____ _____

Esther Damaris NATHAN Date

CERTIFICATION

This thesis entitled: RELATIONSHIP AMONG ACADEMIC SELF-EFFICACY, COGNITIVE ENGAGEMENT AND ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN KADUNA STATE, NIGERIA, by Esther Damaris NATHAN meets the regulation governing the award of the degree of Doctor of Philosophy of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to my dear husband Nathan Dauda Yusuf, my children, Samuel, Natalie, Napoleon, Dr. Naomi, Haro and my grandchildren Emmanuel, Elsa, and Ethan for their encouragement, support and prayers that make this work a reality.

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OPERATIONAL DEFINITION OF TERMS

The following key terms were operationally defined as used in this work:

Academic Achievement: students' average performance measured in three school subjects (Mathematics, English Language, and Government/Chemistry/Commerce) during 2015/2016 terminal terms examination.

Academic Self-efficacy: students' belief in their abilities to take on learning tasks and perform it successfully in order to excel in their academics as well as to produce desire results

Cognitive Engagement: the amount and type of cognitive strategies and psychological processes students expend in the work of learning, which include Deep Processing, Shallow Processing, and Persistence.

Cognitive Strategies: are useful tools, learning methods and all sorts of reasoning students use in order to learn, solve problems more successfully in learning tasks.

Deep Processing: the approach learning to learning that seeks to connect concepts, relate ideas to present knowledge and experience, explore links between evidences and conclusions, critique arguments and examine rationale.

Persistence: perseverance when faced with difficult academic tasks.

Shallow Processing: use of surface way of approach to learning, these include rote memorization, basics rehearsal, and other types of superficial engagement in learning activities.

ABSTRACT

The study investigated the relationships among academic self-efficacy, cognitive engagement and academic achievement of senior secondary school students in Kaduna State, Nigeria. Seven objectives, research questions and null hypotheses guided the study. A correlational research design was adopted in this study. Multistage cluster and stratified random sampling techniques were used to select the sampled educational zones according to the existing four geographical boundaries of the State and data was collected from a total of three hundred and eighty (380) sampled participants from Senior Secondary students of Kaduna State. Four educational zones were selected from each stratum and Morgan Jinks Students Self-Efficiacy Scale (MJSES), Cognitive Engagement Scale (CES), and the students' academic achievement score were adopted to obtain the data for the study. The data collected was analyzed using Pearson Product Moment Correlation Coefficient and Multiple Regression Analysis of PASW version 24 and the decision to retain or reject the hypotheses was made at the 0.05 level of significance. Findings of the study showed that there was significant positive relationship between academic self-efficacy and cognitive engagement of Senior Secondary School students in Kaduna State (r =0 .518, *p* =0 .000). There was significant positive relationships between academic self-efficacy and academic achievement Senior Secondary School students in Kaduna State (r = 0.564, p =0 .000).There was significant positive relationship between cognitive engagement and academic achievement of Senior Secondary School students in Kaduna State (r =0 .377, p = 0.000). It was also found that significant positive relationship existed between deep processing and academic achievement of Senior Secondary School students in Kaduna State (r =0 .454, *p* =0 .000). Based on these findings, it was recommended among others that teachers should formulate programme and activities that would develop and maintain self- efficacy among students so as to boost student's cognitive engagement and interest in their studies. Students should be encouraged by their teachers and parents to be meaningfully engaged in learning activities through interactions with others and worthwhile tasks to achieve meaningful learning. They should device activities that involve active cognitive processes such as creating, problem-solving, reasoning, decision-making, and evaluation to enhance cognitive engagement, academic achievement and deep processing of information rather than shallow processing of information. Psychologist and counsellors should create awareness, educate, sensitize and encourage students to process information deeply which would help not only for the sake of writing and passing examinations but for long term memory retention.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Learning in the world today has remained a springboard and indispensable instrument for human progress and empowerment. Learning is a means to every form of development and ways through which citizens acquire necessary knowledge and skills to be useful in building the nation. This acquisition of skills and attitudes that leads to a change in behavior, which is the goal of education, is referred to as learning. In Nigeria for example, learning has remained a major means of acquiring knowledge and skills in school systems across all levels of learning.

The demand for standard secondary education in Nigeria does not mean increase in enrolment of students or expansion; certain psychological constructs relating to the teacher and student have to be given more priority in order to prepare their mind for the challenges of classroom teaching and learning. Learner who comes to the learning environment possesses certain characteristics that are to be his prerequisite for learning. These characteristics include the cognitive, emotional and the psychomotor aspect that show the motivation for learning variables such as self-efficacy, cognitive engagement, self-esteem, self- actualization, and locus of control (Razmefar, 2014). For effective learning to take place therefore, learner's individual characteristics have to be taken into consideration. Individual characteristics make every learner to have his self-efficacy and lack of self-efficacy could make learner find it difficult to persist in the face of difficulties in academic tasks. Inadequate application of meaningful cognitive strategies use, not investing much effort, and not persistence in the face of difficultiesmight affects student's general performance to attain high academic achievement.

Among the various determinant factors of academic achievement are student's academic self-efficacy and cognitive engagement (Arabzadeh, Shafy,Salami &Bayanati, 2012).The concept of self-efficacy is hypothesized to affect students' beliefs in their abilities, competence, task choices, effort, persistence and level of confidence in achievement. Literature has revealed that self-efficacy has influence over the amount of effort expended in the world of learning, perseverance in facing difficulties in making task choice and task accomplishments both in social and academic learning contexts. Self-efficacy therefore, is a cognitive assessment of one's capabilities to learn and perform actions in specific situations. It refers to the belief that one has control over one's own life (Marzano, 2012). Academic self-efficacy therefore, includes not only the cognitive assessment but also the evaluative and affective components. It involves the student's ability, knowledge, confidence, and persistence. It is characterized as being both a product of students' interactions in the world (enactive engagement) and an influence on the nature and quality of those interactions (Bandura, 1986; Bong & Clark, 1999).

Among the causes of failure in education, as advanced by Bandura as cited in Redmond (2010), is the student's attitude to himself and his abilities and those understandings and point of view of individuals about one's ability. He believes that children who believe that they are capable to carry out given tasks tend to achieve success while students who are not satisfied with their abilities and themselves are most unlikely to go on the success channel. Individuals who have high perception of self-efficacy choose high-level goals for themselves. Cognitive interpretations of successes and failures influence subsequent self-efficacy belief. Based on this submission, therefore, students are said to have high self-efficacy for a task when they believe they possess the capabilities necessary to perform the task successfully. However, if they believe that they do not have

the necessary capabilities, then they would be said to have low self-efficacy for that task. Therefore, in this study, the researcher is focusing on this definition of academic self-efficacy as individual's beliefs in their capabilities to take on learning tasks and perform it successfully in order to excel in their academics.

Based on cognitive interpretations, one most important outcome of motivation is cognitive engagement in learning tasks. Researchers have empirically demonstrated that the level of confidence a student has regarding his/her ability to succeed academically is related to the use of cognitive strategies that translate into higher academic performance. Following the arguments on self-efficacy, psychologists like Mark, (2000); Schunk, (1991);DeBacker andCrowson (2015), have empirically demonstrated that the level of confidence a student has regarding his/her ability to succeed academically is further determined by the use of cognitive strategies that translate into higher academic performance. Cognitive engagement refers to the amount and type of strategies that learners employ to achieve academically. It is a psychological process involving the attention, interest, and efforts students expend in the work of learning Mark, (2000). DeBacker and Crowson (2015), defined cognitive engagement in academic work as, "the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote"(p 76). This means that even the students with high self-efficacy will need to invest seriously in learning and put vigorous efforts towards learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote. The process involved in cognitive engagement should be meaningful. Deep processing (meaningful) is associated with cognitive elaboration of the to-be-learned material. It involves relating the

new information to one's existing knowledge, thus creating a more complex knowledge structure that translates into higher academic performance.

Shallow processing (surface processing), on the other hand, involves role memorization, basic rehearsal, and other types of superficial engagement with the new materials (like simply re-reading one's class notes). Shallow processing will not typically involve connecting new information with existing knowledge nor will it involve creating integrated knowledge (Walker, Greene, &Man-sell, 2006). Research results of (Schunk, 1991; Greene & Miller, 1996; Atherton, 2011), indicate that meaningful processing strategies (meaningful cognitive engagement) lead to greater performance on achievement measures over the material studied than shallow strategies. Thus, the concern of the present study is the use of deep (meaningful) processing strategies to guide students' learning because students' academic achievement seems to be positively influenced by the cognitive strategies they employ to guide their learning. It appears that students who possess and engage in deep cognitive engagement enhance their current perceptions of ability and are more likely to utilize the same deep cognitive engagement in the future.

Academic achievement is viewed as doing or achieving at school: in a class, in a laboratory, in library or in fieldwork (Fuligni, 1997 &Watabe, 2011).Academic achievement is also seen as student's examination grades at the end of a particular academic term or educational programmed. Aremu and Adika (2001), found that academic achievement consistently relates to positive identity structures, which encompass self-esteem, self- efficacy, and motivation. Abbing (2013), identified that academic achievement involves individual self-defining complete performance in domains of school, sport and work. Thus, students' academic activitiesandachievement are increased by their self- efficacy. In line with Mahmoud (2011), academic achievement has been influenced

by a host factors which include the teachers' factors, students' personalities, and mastery of the subject matter, their techniques, the classroom setting, materials to be used and the students' ability, their motivation, their interest in the subject matter, their emotional wellbeing and readiness to learn and even their relationship with their peers. From the foregoing therefore, students' academic achievement is considered as an important means for measuring and evaluating educational outcomes in schools. As noted byRazmefar (2014), Choi (2005), academic achievement has special importance for the student, the people around him or her, the psychologists and the provider(s) of the educational services. Chemer, Hu, and Garcia, (2001), posited that academic self-efficacy beliefs have a mediating effect on the association between academic achievement and identity styles. Thus, encompasses students' beliefs and judgments about their abilities to organize, execute and produce desire results in performance and activities. It includes students' beliefs in their abilities and competence, effort and persistence, and level of confidence and the use of meaningful processing strategies, investing (cognitive engagement) that will lead to greater performance on achievement measures over the material studied when facing academic difficulties.

1.2 Statement of the Problem

Poor Performance as a result of learning is accounted for by many factors such as student's poor academic self- efficacy and cognitive engagement which are often neglected during classroom teaching and learning, assessment or evaluation of students' success or failure in Examinations.

The high rate of poor performance among secondary school students in Kaduna State is a thing of concerned to government, school administrators, parents, students, and others. It has been observed by the researcher that, secondary schools in the state are faced

with students who come to the class with different ways of how they learn. Some students are active, well acquainted with the way they learn in various learning situations, others may be average learners and aware of their learning strength and weaknesses and others may be passive learners who have little awareness of their learning strength and weaknesses. So many students have no ability of knowing the limits of their own memory and learning capabilities, the ability of knowing which learning strategies are effective to process and learn new materials, what learning tasks they can accomplish within a given time, worst still, their ability to belief in their capability and confidence to organize, execute and master their course of study and also their willingness to take on learning tasks, put in effort, to persist and invest in their learning tasks. They do not want to engage themselves in doing academic work which has certain level of difficulty, and majority of students seems to avoid challenging tasks and do not strive under unfavorable conditions, some do not master their subject matter and do not focus sufficiently on learning, as a results, many students in Kaduna state have dropped out of secondary school due to poor academic performance, while others graduate without a single credit and pass in subjects they registered. This deficiency could be linked to ineffective self-efficacy and cognitive engagement awareness. Therefore, for the students to take on learning with determination, they have to be linked to adaptive variables of academic self-efficacy and cognitive engagement.

Evident has shown that, in the State, records of student's overall performance in West African Examination Council (WAEC) and National Examination Council (NECO) over the years according to Kaduna State Ministry of Education, Educational Resources Centre Analysis of S.S.C.E. performance of public secondary schools shows a declining

trend, while the number of students re-enrolling for the examination keeps increasing yearly, as summarized below.

Table 1.1: The summary of WAEC and NECO students' performance records in2011-2014 for public secondary schools in Kaduna State is presented below:

Year of Examination	Number of Students that sat for Exams	Number of Students with five CreditsandAbove	Percentage %
2011 WAEC	35,214	2,877	10.76%
NECO	41,338	1,220	3.07%
2012 WAEC	33,105	4,957	14.97%
NECO	32,081	1,243	3.78%
2013 WAEC	36,291	3,274	9.02%
NECO	42,976	3,680	8.56%
2014 WAEC	25,653	3,156	12.30%
NECO	32,081	4,487	13.99%

Source: Educational Resource Centre, Kaduna (2015)

The data above shows a dismal performance of students in both WAEC and NECO examinations. From all indications, this poor performance is quite disheartening and very worrisome and needs urgentattention. Much as the situation here causes concern, it is not known why some students fail to attain the standard expected of them given the discouraging records of academic performance among the students within the period under review, their ability, knowledge, confidence, and persistence to achieve in academic tasks is questionable. Also questionable is the students' use of cognitive strategy, psychological investments in and effort directed toward learning, understanding, or mastering the knowledge and skills they require to effectively achieving high in academic tasks.Therefore the importance of this problem lies in the fact that if students are left unchecked and the same poor result continues to surface,they are likely to continue to

perform below standard and concequently, these will affect the students overall academic acheivement in both internal and external examination in secondary schools.

It is out of this concern that the present researcher feels there is the need to ascertain whether students are not being motivated to benefit from education outcomes. This calls for an urgent empirical research evidence to salvage the situation, so that the same poor result may not continue to surface among secondary school students, they will not continue to perform below standard and consequently, affecting the students' overall academic achievement and educational objectives of the country and man power development ofthe nation, Nigeria particularly in the area of education. It is in the light of the above situational problems that this study was carried out to find out the relationships among academic self-efficacy, cognitive engagement and academic achievement so that secondary school students in the state might be helped to develop their self-efficacy and cognitive strategies, in order to take control of their learning process and consequently record high academic achievement especially in their internal and external examinations.

1.3 Objectives of the Study

The specific objectives are to find out:

1. the relationship between academic self-efficacy and cognitive engagement ofsenior secondary school students in Kaduna State, Nigeria;
2. the relationship between academic self-efficacy and academic achievement ofsenior secondary school students in Kaduna State, Nigeria;
3. the relationship between cognitive engagements and academic achievement of senior secondary school students in Kaduna State, Nigeria;
4. the relationship between deep processing and academic achievement of senior secondary school students in Kaduna State, Nigeria;

5. the relationship between persistence and academic achievement of senior secondary school students in Kaduna State, Nigeria;
6. the relationship between shallow processing and academic self-efficacy of senior secondary school students in Kaduna State, Nigeria;
7. relationship among deepprocessing, shallow processing and academic achievement of senior secondary school students in Kaduna State, Nigeria;

1.4 Research Questions

The following research questions guided the study.

1. What is the relationship between academic self-efficacy and cognitive engagement ofsenior secondary school students in Kaduna State, Nigeria?
2. What is the relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna State, Nigeria?
3. What is the relationship between cognitive engagements and academic achievement of senior secondary school students in Kaduna State, Nigeria?
4. What is the relationship between deepprocessing and academic achievement of senior secondary school students in Kaduna State, Nigeria?
5. What is the relationship between persistence and academic achievement of senior secondary school students in Kaduna State, Nigeria?
6. What is the relationship between shallow processing and academic self-efficacy of secondary school students in Kaduna State, Nigeria?
7. What is the relationship among deep processing, shallow processing and academic achievementof senior secondary school students in Kaduna State?

1.5 Research Hypotheses

Inline with the research questions, the following null hypotheses were generated.

Ho1 There is no significant relationship between academic self-efficacy and cognitive engagement of senior secondary school students in Kaduna State.

Ho2 There is no significant relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna State.

Ho3 There is no significant relationship between cognitive engagement and academic achievement of senior secondary school students in Kaduna State.

Ho4 There is no significant relationship between deep processing and academic achievement of senior secondary school students in Kaduna State.

Ho5 There is no significant relationship between persistence and academic achievement of senior secondary school students in Kaduna State.

Ho6 There is no significantrelationship between shallow processing and academic self-efficacy of senior secondary school students in Kaduna State, Nigeria

Ho7 There is no significantrelationship among deepprocessing, shallow processing and academic achievement senior secondary school students in Kaduna State.

1.6 Basic Assumptions of Study

This study is based on the following assumptions:

1. Academic self-efficacy may predict senior secondary school student's cognitive engagement level in Kaduna State, Nigeria.
2. Academic self-efficacy may boost academic achievement of senior secondary school students in Kaduna State, Nigeria.
3. Cognitive engagement may correlate with academic achievement of senior secondary school students in Kaduna State, Nigeria.

4. Deep processing may correlate with academic achievement of senior secondary school students in Kaduna State, Nigeria.
5. Persistence may correlate with academic achievement of senior secondary school students in Kaduna State, Nigeria.
6. Shallow processing may correlate with academic self-efficacy of senior secondary school students in Kaduna State, Nigeria
7. Deep processing and shallow processing may correlate with academic achievement of secondary school students in Kaduna State.

1.7 Significance of the Study

The outcome of this findings will be of benefit to the following; Teachers, students, parents, psychologists, counsellors, educationist, curriculum experts, government and finally the existing body of knowledge.

With respect to teachers, the findings of this study will provide those effective guidelines and programmes that will help in the area of planning of lessons which will involve the use of appropriate methods of teaching, setting of goals that will motivate and engaged students cognitively to learn and achieve desirable results in their studies.

The findings of this study willhelp in the provision of baseline information to students. Students who are at the center of this study will benefit from the findings through effective formative and diagnostic evaluation of their educational achievement. They will identify areas of problems that is knowing the causes of their learning problems, understanding their thinking errors. The result of this study will restructure their cognition about their learning as they will be able to learn new ways of thinking that will have positive effect on their learning activities as they will be able to for good academic competition, invest and put more efforts, persist, and apply deep processing in their

learning for good academic competition and they will understand the values been placed on education by their teachers.

As for parents, this study will be relevant to them and other care givers to understand the importance of the need to re-structure the home environment and neighborhood with rich and conducive learning facilities, provisions of supportive services and sustainable motivation and monitoring the activities for improving their academic self-efficacy, engaged them cognitively in learning and achievement. The findings will serve as an array of functions that include enhancement of school-parents' communications on achievement of students' educational goals which would enhance their efficacious beliefs, competences to perform and the use of different types of strategies that are meaningful and will result to deep learning.

The findings of this study will help psychologists, counsellors, educationists and curriculum experts especially in the area of education to benefit from the study as a reference materials in the area of learning, and with the understanding of these psychological variables that might be responsible for student's success and failures in examinations they might be able to counsel students in their area of difficulty in secondary schools in Kaduna State.

In addition, the study will help to ascertain vividly the role of Ministry of Education in Kaduna State especially the Quality Evaluation Board to ensure the provision of appropriate instructional materials and training the uses of these materials by teachers in the classroom and ensure and proper adequate monitory and evaluating such polices and implementing such packages in such a manner that challenges will be effectively put under control.

The government, particularly policy makers in education, will find the result of this study very significant as it will provide them with evidence based empirical data that will help them to formulate effective educational blue prints and strategies that will help students right from elementary school to develop goal setting skills, appropriate learning and study styles, and perception of self which are crucial in effective learning.

Finally, the scholarly importance of this study cannot be overemphasized as the findings will contribute to existing body of knowledge, provide information, open up research areas and assist in the design of such studies for student researchers in educational psychology and it will also serve as a reference material for researchers whose research problems may be related to this study.

1.8 Scope and Delimitation of the Study

The study covered385 public senior secondary schools in Kaduna State public schools that are independent from junior secondary schools. The senior secondary schools that are independent here means those that are separated differently from the junior secondary schools. The study involves 16 senior secondary schools selected from 4 Educational Zones across Kaduna State. The study focused mainly on male and female students in senior secondary schools. Only SS II students of the selected schools were used for the study. The study was restricted to variables such as academic self-efficacy, which centers on student's beliefs in their abilities and competence, efforts, persistence and level of confidence in undertaking academic tasks and achievements. Cognitive engagement as cited by Greene and Miller (1996), are reviewed and also the instruments. The construct of academic achievement used in this study referred to the average performance of terminal examinations of SS IIstudents in three subject areas namely Mathematics, English, and Governmen/ chemistry/commerce.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter review literature related to relationship among academic self-efficacy, cognitive engagement and academic achievement. To this end, the chapter is structured into the following sub-themes:

Academic Self-Efficacy
Cognitive Engagement
Concetp of Academic Achievement
Theoretical Framework
Conceptual Framework
Review of Related Empirical Studies
Summary

2.2 Concept of Academic Self-Efficacy

Self-efficacy, also called perceived ability, according to Zimmerman (1995), refers to as the component of self-concept that concerns individual beliefs in their capabilities and competencies to handle a given task. If learners possess the ability to successfully perform task, then that task will be attempted. The task will be avoided if it is perceived to be too difficult. Although inefficacious individuals usually avoid challenging tasks, when they do attempt them they give up more easily than individuals with high efficacy. When inefficacious 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. If students master a challenging task with limited assistance, their levels of self-efficacy rise.

Existing literature has provided an array of definitions and explanations of academic self-efficacy. For instance, self-efficacy is a concept drawn from Bandura's (1997), broad theory of the person, which posits that human achievements depend on the reciprocal interactions of the person's behavior, personal factors (or self), and environmental conditions. Self-efficacy is one of the personal factors and is defined as "the conviction that one can successfully execute the behavior required to produce the outcomes". It was pointed out that self-efficacy leads to specific behaviors and motivations that can encourage or discourage effective performance.

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 achievement to their abilities. It is the perception that their abilities caused the achievement that affects the outcome rather than their actual abilities. Four factors determine self-efficacy: enactive mastery experience, vicarious experience, verbal persuasion, and physiological and emotional states. The most influential of these factors in 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 capacity. 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 (Hawthrone, 2004). 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 positively or negatively affect interpretation of an event's outcome. In addition to the four factors that determine general self-efficacy, aptitude, attitudes, and attributions are found to predict science self-efficacy (Smist; Archambault; & Owen, 1997).

Efficacy beliefs vary between individuals and will actually fluctuate within an individual for different tasks. In many activities, self-efficacy contributes to self-esteem (Hawthrone, cited in Redmond, 2013). Self-efficacy beliefs affect how people approach new challenges and will contribute to performance since these beliefs influence thought processes, motivation, and behavior. Self-efficacy is not static and can change over time resulting from periodic reassessments of how adequate one's performance has been. For example, in a college population, Chemistry laboratory self-efficacy increased over the course of a school year whereas Biology self-efficacy decreased over the same duration (Smist, 1993).

Numerous studies will show that females possess lower Math and Science self-efficacy than males and as a result, often earn lower grades in these academic subjects. Consequently, females may be less likely to pursue technical and scientific careers. Furthermore, self-efficacy enhances learning and performance. Shkullakku (2013) notes that students with high academic self-efficacy;

i) view failures as a result of insufficient effort or knowledge, not as a deficiency of aptitude and increase their efforts in cases of failure to achieve the goals they have set,

ii) view problems as challenges to be mastered instead of threats and set goals to meet the challenges,

iii) are committed to the academic goals they set,

iv) Have a task-diagnostic orientation, which provides useful feedback to improve performance, rather than a self-diagnostic orientation, which reinforces the student's low expectation about what he or she can accomplish.

Bandura (2001) defined self-efficacy in his guide for constructs self –n scales as "a conception that one nurtures about his/her own personal power to achieve a given level of performance" p.79. This gives highlights on the reciprocal or cyclical relationships among the environment, self, and behaviors posited by Bandura's social cognitive theory. Environmental interventions may improve self-efficacy, which can lead the student to select more challenging tasks, which in turn creates more opportunity for useful feedback and can lead to increased self-efficacy and better outcomes.

Redmond (2013) sees self-efficacy as people's belief about their abilities in particular domains is thought to be important in motivating them to do what they want to achieve. He asserts that self-efficacy is related only to performance expectations and does not depend on the value placed on the task. Shkullaku (2013) notes that the more specific and skill-related the self-efficacy measure is the more predictive it is likely to be for performance achievement. He further, explains that students who are self-efficacious appear to use more self-regulating strategies which leads to higher achievement. Tenaw's, (2013) notes that it is possible to have high self-efficacy about a capability that one does not particularly value as well as the reverse.

In his own contribution, Pajares (1996) opines that self-efficacy and other expectancy beliefs share some similar characteristics because they are beliefs about one's

perceived capacity, but they differ in that self-efficacy is defined in terms of individuals' perceived capabilities to attain designated types of performance and achieve specific results.PintrichandSchunk (1995) explains that, in the academic realm, self-efficacy beliefs have received increasing attention in such areas as academic motivation and self-regulation. Academically therefore Schunk (1991) sees self-efficacy as one's perceived capability to perform given academic tasks at the desired level.

Zimmerman (1995) defines Academic self-efficacy "as personal judgments of one's capabilities to organize and execute course of action to attain designated types of educational performance" Zimmerman, in a research finding on self-efficacy points out that, self-efficacy is being characterized by its responsiveness to variation in personal experience and attainment and its sensitivity to teaching techniques and instructional strategies.

Akomolafe, Ogunmakin, and Fasooto, (2013) has drawn a clear distinction between self-efficacyandself-concept. He relates self-concept to 'normative' assessment of ability. Self-concept involves often establishing external comparisons, stimulated by the desire to outperform others while he associates self-efficacy with 'mastery criteria' that is, focusing rather on one's own assets and limitations and evaluating one's own personal competence to succeed in a given domain. In line with Goulao (2014) equally alludes to this fact by pointing out that self-efficacy beliefs are context-specific, self-appraisals of capacities, self-concept is a "global description of one's personal essence". That is to say, it is a general conception (or image), consisting of a body of attitudes and values, that one comes to develop about his/her "being" as a result of social transactions. Self-efficacy is the perception of one's own ability to reach a goal; self-esteem is the sense of self-worth. Pajares (1996) cited an example; a person who is a terrible rock climber would probably

have poor self-efficacy with regard to rock climbing, but this will not affect self-esteem if the person doesn't rely on rock climbing to determine self-worth. However, one might have enormous confidence with regard to rock climbing, yet set such a high standard and base, enough of the self-worth on rock climbing skills, that self-esteem is low. Someone who has high self-efficacy in general but is poor at rock climbing might have misplaced confidence, or believe that improvement is possible.

Loo and Choy (2013) sees self-efficacy as a person's belief in his or her ability to succeed in a particular situation. He asserts that these beliefs serve as determinants of how people think, behave and feel. That is, one's sense of self-efficacy can play a major role in how one approaches goals, tasks and challenges. Thus, the theory of self-efficacy emphasizes the role of observation learning and social experience in the development of personality.

In a further contribution, Razmefar (2014) believes that children who believe that they are able to afford some assignment actually do it and children who are satisfied about themselves and their abilities are likely to promote. In other words, those students who are confronted with a variety of attitudes about themselves and their abilities would fail. Students, who have a high self-efficacy concept, shows a greater perseverance in doing their assignments, are not afraid of situations and choose high level aims for them. Razmefar(2014) sees students with high self-efficacy – that is those who believe they can perform well are more likely to view difficult tasks as something to be mastered rather than something to be avoided. In line with these, Redmond (2013) explained further, that "effort and persistence in a task that will lead to success cause to increase in their confidence and would go up the motivation of these people, and in next situations they will start new behaviors with a belief that they are able to success."

Further stressing the point, Klassam and Lynch (2007) submits that students with high self-efficacy tend to outperform predicted expectations, while those with low self-efficacy often do not attain their true potentials. He explained it as students participate in activities in which they feel competent and avoid those in which they do not. In line withRedmond (2010) further observed that, self-efficacy determines whether or not someone will choose to take on a challenging task or write it off as impossible. By determining the belief, a person holds regarding his or her power to affect situations, it strongly influences both the power a person actually has to face challenges competently and the choices a person is likely to make. Goulao (2014) defined academic self- efficacy as the level of confidence that a student felt regarding his or her ability to successfully complete academic tasks or reach selected academic milestone.

Shell, Brunning and Colvin (1995) looked at the three aspects that have received the most attention in research as;

1) **Self-efficacy** – defined as confidence in one's abilities to successfully perform a particular task;
2) **Outcome expectancy** – defined as beliefs that a particular behavior will result in particular outcomes;
3) **Causal attributions** – defined as one's judgments about what causes success or failure to perform tasks.

For this study, only self-efficacy will be looked into and discussed in relationship to student's academic achievement. Though, Pajares (1996) sees self-efficacy and other expectancy beliefs to share some similar characteristics because, they are beliefs about one's perceived capacity; but they differ, in that self-efficacy is defined in terms of

individuals perceived capabilities to attain designated types of performance and achieve specific results.

Redmond (2013) equally alludes to this fact by pointing out that Academic Self-efficacy is the belief that one can successfully engage in and complete course – Specific academic tasks, such as accomplishing course aims, satisfactorily completing assignments, achieving a passing grade, and meeting the requirements to continue to pursue one's major course of study. In other words, Redmond sees the term self-efficacy to refer to the power to produce that effect by completing a given task or activity related to that competency, stressing that, self-efficacy is a belief in one's efficacy.

Therefore, self-efficacy beliefs determine how people try to conduct their activities and how much they resist against the obstacles (Pajares& Schunk, 2001). Pajares and Miller (2001) further add that, student who develops a strong sense of self-efficacy one well equipped to educate them when they have to rely on their own initiative. Therefore, self-assured individuals perceive students and proffer solutions to any problem they may encounter. Thus, efficacy stands as a source of strength.

2.2.1 Sources of Academic Self-Efficacy

These sources help individuals determine if they believe they have the capacity to accomplish specific tasks. As noted by Williams and Williams (2010) that "individual with high levels of self-efficacy approach difficult tasks as challenges master rather than as a threats to be avoided" (p.455). Self-efficacy theorists Bandura (1997) advanced the assertion that self-efficacy beliefs affect every aspect of a person's life. In school, these perceptions students hold about their academic capabilities were hypothesized to be acquired and modified through four main sources of experiences, as will be discussed in order of importance below:

i. Mastery Experience or enactive attainment

Research has shown that it is the most influential source of efficacy information in otherwords known as performance accomplishment.Loo and Choy (2013) refers to it as influential because they provide the most direct, authentic evidence that an individual can gather the personal resources necessary to succeed. It refers to success which raises self-efficacy and failure lowers it. As individual might expect, past successes to raise efficacy beliefs, while constant failures, in general, can lower them. That is when strong efficacy expectations are developed through repeated success, the negative impact of occasional failures will be reduced to minimal. Previous record of performance successfully can enhance a sense of self-efficacy, on the other hand, failure to adequately deal with a task and challenges can lower or weaken it, which will in turn affect academic achievement (Chandler, 2006; Williams & Williams 2010). Therefore, the impact of failure on personal efficacy really depends on the strength of individuals existing efficacy beliefs, as well as the timing with respect to the totality of their performance experience. In other words, success results to high self-efficacy. In line with, Schunk (1995) who viewed it as "enactive attachment" and refers to it as to the way people assess their own personal attainment in a given arena, like students who sees their own past academic results as being successful normally will develop a high sense of confidence about their abilities while those who sees their own as unsuccessful are likely to experience feelings of doubts and uncertainty about their performance. Therefore, success raises self-efficacy, while failure lowers it.

ii. Vicarious Expectancy or observational

It is learning by observation. It is related to self-evaluation that individuals derive from observing and comparing themselves with classmates, friends. Individual can learn

by observing the successes and failures of others. When individuals observe model that they see as compatible with them in terms of skills and traits, when they see someone succeeding in solving a given task, they are likely to face similar challenge (liketheir own self-efficacy increases). Nevertheless, if otherwise, they might undermine their self-confidence. As such efficacy beliefs enforced by observation and modeling others only, tend to be weaker and more susceptible to change (Loo &Choy, 2013). As rightly observed by Bandura who posit that,seeing people similar to oneself succeeding by a sustained effort raises observers' beliefs that they too possess the capacities and comparable activities to succeed 1994, p.5. Thus, modeling is particularly useful for people who are unsure of themselves.

iii. Social Persuasion (Verbal and otherwise)

Verbal and non-verbal messages may become manifests when people developing their capabilities in a given field are likely to be influenced by the verbal and 'tacit' output persons that are regarded as "credible persuaders" (Zimmerman, 1995) and "believable evaluators" in their own environment such as parents, teachers, experts. Discouragement is generally more effective at decreasing a person's self-efficacy than encouragement is at increasing it. The conceptions developed by people about their capacities are influenced by verbal output they receive from others. That is, it is widely used in academic institutions to help students believe that they can in fact cope with difficult situations. In line with Tenaw (2013) viewed verbal persuasion alone as to be limited in its power to create enduring increases in perceived efficacy, but it can bolster self-change if the positive appraisal is within realistic bounds.

iv. Emotional and Physiological States

This comes from one's own physiological and emotional feedback during performance, particularly that involving physical activity. Redmond (2013) asserts that, self-efficacy estimates might also be affected "somatic and emotional state" it is not always the negative. Stress reactions such as, fear, anxiety sweating, increased heart rate only that can affect performance negatively rather, it is the faulty interpretations that students make about the purported causes of those psychological states. For instance, students tend to expect, to a greater extent, when they are not overcome by stress reactions than if they are tense and agitated. That is, students might develop a low opinion about their competence in a given field when they are judge wrongly the normal state of tension that accompany certain important academic events (exams) as an indication of incompetence and inefficacy. Thus, information passed by physiological reactions is cognitively assessed by individual and can positively or negatively influence efficacy beliefs, depending on the level of arousal and a person's cognitive appraisal (Bandura, 1997).

Concept Map of Sub-Constructs

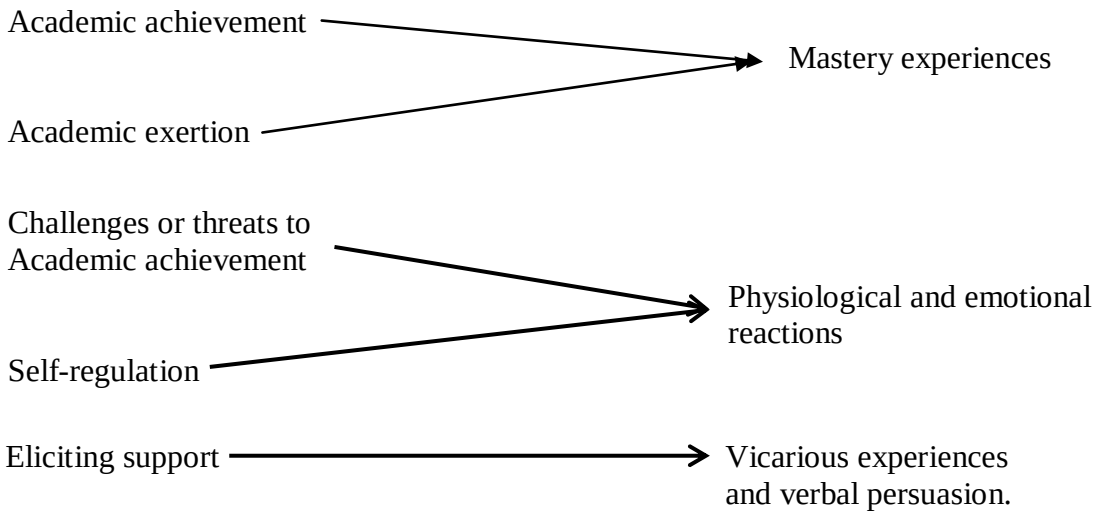


Figure 1: Concept Map of Sub-Constructs

Source: Bandura (1997)

This concept map displays the proposal relationship between the sub- constructs of self- efficacy and the sources from which students derive their beliefs in their academic capabilities. Academic self-efficacy has been classified into five (5) sub-constructs as described by Bandura (1997). These are;

1. **Academic achievement** – the belief in one's capability to learn academic subjects in school is linked with mastery experiences.
2. **Academic exertion** – the belief that one's effort can result in academic achievement is also seen to be related to mastery experiences.
3. **Challenges and threats to academic achievement** – the belief that despite difficulties that could impede learning, one can find solutions is linked to physiological and emotional reactions.
4. **Self-regulations** – the belief in one's capability to control and monitor personal behavior so as to enhance learning or to not impede it, is also linked to physiological and emotional reactions, and
5. **Eliciting support** – the belief in one's capability to gain academic assistance when necessary is linked to vicarious experiences and verbal persuasions.

2.2.2 Dimension of Self-Efficacy

Virtually all people can identify goals they want to accomplish, things they would like to change, and things they would like to achieve. However, most people also realize that putting these plans into action is not quite so simple. Redmond and Williams (2013) found that an individual's self-efficacy plays a major role in how goals, tasks, and challenges are approached. In his study he classified people into two groups. People with strong sense of self-efficacy can;

i) view challenging problems as tasks to be mastered,

ii) develop deeper interest in the activities in which they participate,

iii) form a stronger sense of commitment to their interests and activities, and

iv) recover quickly from setbacks and disappointments.

While, people with a weak sense of self-efficacy can;

i) avoid challenging tasks,

ii) believe that difficult tasks and situations are beyond their capabilities,

iii) focus on personal failings and negative outcomes, and

iv) quickly lose confidence in personal abilities.

However, Redmond notes that by learning how to minimize stress and elevate mood when people are faced with difficult or challenging tasks, people can improve their sense of self-efficacy.

Developing self-efficacy in school

Students are usually over confident about what they can do. As such self-appraisal skills improve with development. In self-efficacy research, it is uncommon for student to feel highly efficacious about accomplishing difficult tasks, even being provided with feedback indicating low performance may not decrease self-efficacy (Marzano, 2012). Students at times underestimate their capabilities and believe that they cannot acquire basic skills. Students often lack task familiarity and do not fully understand what is required to execute a task successfully.

As students gain experience their accuracy improves. They may be unduly swayed by certain task features and decide based on these that they can or cannot perform the task while ignoring other features. For example, in subtraction, children may focus on how many numbers the problems contain and judge longer problems more difficult than those with fewer numbers, even when the longer ones are much simpler. As their capability to

focus on multiple features improve so does their accuracy. Students may also have faulty knowledge about their performance capabilities. In writing, for example, it is difficult for them to know how clearly they can express themselves or whether their writing skills are improving (Mahyuddin, Elias, Cheong, Muhamad, Noordin & Abdullah 2011,). Teacher feedback – especially at the elementary level is intended to encourage and stress what students do well. Students may believe they can write well when in fact their writing is far below normal for their grade level. As they grow, children gain task experience and engage more often in peer social comparisons, which improve the accuracy of their self-assessments.

The preceding explanation should not imply that younger children's self-appraisal skills cannot become more accurate. Instruction and opportunities to practice self-evaluation enhance accuracy of self-perception and instructional interventions that convey clear information about children's skills or progress raise efficacy – performance correspondence (Redmond, 2010).

General factors have been attributed to decline in self-efficacy beliefs of students as they advance through school (Marzano, 2012) factors, like greater competition, more norm-referenced grading, less teacher attention to individual student progress, and stresses associated with school transitions. These and other school practices can weaken academic self-efficacy, especially among students who are less academically prepared to cope with increasingly challenging academic tasks. Lock-step sequences of instruction frustrate some students who fail to grasp skills and increasingly fall behind their peers (Bandura, 1997). Ability grouping can lower self-efficacy among those relegated to lower groups. Class rooms that allow for much social comparison tend to lower the self-efficacy of students who find their performance inferior to those of their peers.

Students' enrolment and participation in school depend in part on how much the school environment contributes to their perceptions of autonomy and relatedness, which in turn influence self-efficacy and academic achievement. Although parents and teachers contribute to feelings of autonomy and relatedness, peers become highly significant during adolescence. The peer group context enhances or diminishes students' feelings of belonging and affiliation (HekmatiNejad, 2001).

Few studies have investigated the relationship between self-efficacy and academic achievement in higher education. Of the college studies mentioned here, most (Miller et al, 1996; Multon, Brown, & Lent 1991; Chemers, Hu& Garcia, 1993; Hemlo-Silver, 2004) support a connection between self-efficacy and academic achievement. In general, students at the college level need to be self-directed and greater responsibility for their learning. Students possessing a high degree of self-efficacy are more successful at accomplishing these tasks and as a result, perform better academically. Accordingly, self-efficacy beliefs are "crucial" when applied to the cognitive demands of higher education (Redmond, 2010).

Stronger relationships were found between self-efficacy and performance for high school and college students when compared to younger students in a meta-analysis of 39 self-efficacy studies (Multon, Brown, & Lent, 1991). Out of the studies included, 28.9% involved higher education. However, from the list of studies analyzed, it was unclear how many, if any, involved science classes. The previously mentioned study (Greene & Miller, 1996) found a positive correlation between perceived ability, learning goals, and meaningful cognitive engagement which then influenced college achievement. Two different studies measured self-efficacy in two-year college students and reported conflicting results. In nontraditional associate degree nursing students, self-efficacy was not found to predict academic achievement (Bong&Clark, 1999). Academic variables, such

as study hours, study skills, and absenteeism, were the only statistically significant contributors to students' achievement. Reliability for academic variable measurement in this study, however, was slightly below an acceptable limit (Bong & Clark, 1999). In contrast, another study (Hemlo-Silver, 2004) found self-efficacy positively related to achievement in social science classes for community students.

A study of college students found academic self-efficacy to be significantly more predictive of career choice than academic achievement (Hirschorn, 1988) in Greene & Miller (1996). The study also found semester academic performance was positively influenced by perceived goals and previous academic experience, instead of self-efficacy (Greene & Miller, 1996). The researcher stated her findings do not negate self-efficacy's mediating influence on past achievement and thus, self-efficacy could contribute to academic achievement via this mediatory role. Other studies (Biggs, 1989; Multon, Brown, & Lent 1991; Greene & Miller, 1996) further supported the assertion that, the mediating effects that academic self-efficacy in itself has no academic achievement.

2.2.3 Gender in Self-Efficacy

The relationship between gender and self-efficacy has been a focus of research. In general, researchers report that boys and men tend to be more confident that girls and women in academic areas related to mathematics, science and technology (Meece, 1991; Pajares& Miller, 1994; Wig field, Eccles&Pintrich, 1996), despite the fact that achievement differences in these areas either diminishing or have disappeared (Eisenberg, 2000). Contrary, in areas related to language arts, male and female students exhibit similar confidence despite the fact that the achievement of girls typically is higher (Pajares, 2000).

As Pajares and Schunk (2001) observed, the literature has identified one factor especially relevant for considering measurement options, which is a comparative approach is used in assessing self-efficacy. Typically, students rate their confidence that they possess certain skills or can accomplish particular tasks, for example, indicating whether they thought they could complete a written assignment on a certain topic. Similarly, Gender differences in self-efficacy are confounded by a number of factors. According to Wig field that;

1. These differences often are nullified when previous achievement is controlled (Pajares, 2000; Shkullaku, 2013). Boys and girls also have a tendency to adopt a differing stance when responding to self-efficacy instruments.
2. Researchers have observed that boys tend to be more self-congratulatory in their responses while girls are more modest (Wig field, Eccles & Pintrich,1996; Tenaw, 2013).
3. Another confounding factor is related to the manner in which gender differences typically are assessed and reported. Students usually are asked to provide confidence judgments' that they possess certain academic skills or can accomplish academic tasks. Differences in the average level of confidence reported are interpreted as gender differences in self-efficacy. Schunk and his colleagues asked elementary and middle school students to provide self-efficacy judgments' in the traditional manner i.e. confidence in possessing writing skills and to make comparative judgments' regarding their writing ability versus that of other boys and girls in their class and school (Momanyi, Ogoma, & Misigo, 2010; Pajares&Valiante, 1997; Tenaw,2013, Shkullaku, 2013). Although girls out performed boys, girls and boys reported equal writing self-efficacy. When students

were asked whether they were better writers than their peers, girls however, judged themselves to be better writers than the boys.

Another factor that deals with the nature of self-belief may be undergirding those differences. Researchers have argued that gender differences in social, personality and academic variables may actually be a function of gender orientation – the stereotypic beliefs about gender that students hold – rather than of gender (Eisenberg, 2010; Betz & Hackett, 1985; Wolters, 1997; Stone, 1994). Eccles' (1987) model of educational and occupational choice in his own submission posits that cultural factors such as students' gender role stereotypes are partly responsible for differences in course and career selection and in confidence beliefs and perceived value of tasks and activities. Pajares and Valiante, (1997); Mahyuddin *etal*, (2011) found that gender differences favoring middle school girls in writing self-efficacy were nullified when gender orientation beliefs were controlled.

Gender differences are related to developmental level. There is little evidence for differences in self-efficacy among elementary-aged children. Differences begin to emerge following children's transition to middle or junior high school (Wig field, Byrnes & Eccles2006; Tenaw, 2013; Shkullaku, 2013), with girls typically showing a decline in self-efficacy beliefs.

Among adolescents, gender differences in self-efficacy should not be expected when students receive clear performance information about their capabilities or progress in learning.

Betz and Hackett (1983) in a related study, had students in Grade 6 and 8 judge self-efficacy for learning a novel mathematical task, after which students received instruction, practice opportunities and performance feedback. Although girls initially judged self-efficacy for learning lower than did boys, following the instructional program

girls and boys did not differ in achievement or self-efficacy for solving problems. The performance feedback conveyed to students that they were learning and raised girls' self-efficacy to that of boys.

Social cognitive theory does not endow either gender or gender self-beliefs with agented and motivating properties (Bandura, 1999). Researchers have observed that students typically view such areas as mathematics, science and technology as male domains (Eisenberg, 2010). In these areas, a masculine orientation is associated with confidence and achievement because masculine self-perceptions are imbued with the notion that success is a masculine imperative (Eccles, 1987; Betz& Hackett, 1983). In line with research studies of Jahun and Momoh (2001),Momanyi, Ogoma, and Misigo, (2010) and Akomolafe (2010) reported that there are gender differences in academic achievement in mathematics and science subject with boys performing better than girls in these areas. Contrary to this, Ayedum and Popoola (2004) reported no significant difference in the performance of boys and girls in mathematics. Bongand Clark (1999) equally alludes to this fact by pointing out that in his findings when investigating personal factors affecting academic self-efficacy judgments. Girls' self-efficacy perceptions were more subject specific than boys, and girls in particular showed greater differentiation between verbal and mathematics subjects. In another submission, language arts typically are associated with a feminine orientation because writing is viewed by most students as a female domain. A feminine orientation is associated with motivational beliefs related to success in writing. One challenge before educators is to alter students' views of academic subjects so that they are perceived as relevant and valuable both to girls and boys.

Starting in grade seven, girls tend to underestimate their abilities in Math and Science (Sax, 1994). Several studies (Nix, Perez-Felker, &Thomas, 2015) have

documented that female students have lower self-efficacy in Math and Science compared to male students. Girls' capabilities are undermined by sex-role stereotypes in many cultures intimating that females are not as able as males, especially in such disciplines as Math and science (Bandura, 1986; 1997). Another contributing factor could be the lower level of expectations that parents, teachers, and counselors often hold for girls, which can discourage further study in scientific and technical fields (Aauwef, 1999; Lee, 1998; Bandura, 1997; Sax, 1994). Although girls' Math and Science enrollments increased during the nineties and even exceeded boys in Biology and Chemistry, boys are still enrolled more often in Physics and higher-level science courses than girls (Aauwef, 1999). Confidence is strongly correlated to students continuing in Math and Science courses (Perez-Felker, Nix, & Thomas, (2017). In addition, males display more positive attitude towards careers in science than females (Smist, Archambault& Owen, 1997).

Regardless of gender, more career options, including potentially higher career aspirations, are considered by those possessing a high degree of self-efficacy (Bandura, 1986). Self-efficacy can even predict career choice. Because of this influence, "efficacy beliefs partly shape the courses that lives take" (Bandura, 1997). If females perceive their abilities to be low in math and science, a whole technological sector of highly-esteemed, high-paying careers may become off-limits to them. In two separate studies of high school Math students, (Miller, Greene, Montalio, Ravindran& Nicholls, 1996) found that females had lower perceived ability levels in math than males. Low mathematical self-efficacy and inadequate high school math preparation, both being observed give rise to more often in females than in males, lower female aspirations for future study in scientific and technical fields (Jacob, Davis-Kean, Bleaker, Eccles, & Malanchuk, 2005). Math self-efficacy is a "critical factor" in career choice (Kennedy, 1996). Students with higher levels of math

confidence earn better grades in college and pursue science majors more often (Sax, 1994). However, mathematics confidence often declines in college and more so for women than men; but for women who pursue math and science majors, mathematics confidence increases (Sax, 1994). In addition to the studies mentioned here, a significant amount of research has found low mathematical self-efficacy in females. A study conducted in the seventh-grade found higher science self-efficacy in boys and also they intended to take more elective science classes (Pintrich&DeGroott; Lee, 1998).

In a college general chemistry class, a statistically significant finding was reported with males scoring higher than females in science self-efficacy for laboratory skills (Smist, 1993). The study also mentioned that females had lower self-efficacy scores than males for the sciences; however, this finding was not statistically significant. High school males were found to have higher self-efficacy in physics, chemistry and in the laboratory. The same study found females scored higher in self-efficacy than males for biology (Smist, Archambault& Owen, 1997). One point to consider is that the researchers only collected information from gifted and talented students and therefore, not all student ability levels were represented.

Perceived ability was the greatest predictor of semester grades for females in high school biology (DeBacker & Nelson, 2000). Also, females' perceived ability was negatively related to stereotyped beliefs about science. Effort, persistence, and achievement appeared to have a stronger association with perceived ability for females than for males in this population (DeBacker& Nelson, 2000). DeBacker and Nelson (2000) also found that high school girls scored lower than boys on perceived ability in biology, accelerated chemistry, physics, and advanced placement physics. The researchers expressed concern because regardless of achievement level, girls scored lower.

Most of the research has focused on junior and high school students and has shown that females have lower levels self-efficacy in math and science classes. Little is known about whether such differences exist in student self-efficacy levels based on gender in college science, excluding in Smist (1993) study where attrition was a problem. Lower self-efficacy in female students is a concern because low self-efficacy has been linked to lower academic performance.

2.2.4 Self-Efficacy Interaction with the Environment

According to Bandura (1997), two levels of efficacy (low and high) interact with two types of environment (responsive and unresponsive) to produce the following four predictive variables:

1. **Success (H, R):** A person with a high level of self-efficacy in responsive environment will be successful. Their positive attitude toward their abilities coupled with environmental change promotes success and improves long-term motivation.
2. **Depression (L, R):** A person with a low level of self-efficacy in a responsive environment may fall into a depressed state. They know the environment will change but their lack of belief in their own abilities stops them from trying and succeeding.
3. **Apathy and Helplessness (L, UR):** A person with low self-efficacy and an unresponsive environment will feel helpless and decide that all efforts are pointless thus causing them to be completely inactive.
4. **Effort Intensification or Change of Course (H, UR):** A person with high self-efficacy in an unresponsive environment will either increase their efforts toward change or decide they need to change their goals. (p. 200-208)

2.2.5 Self-Efficacy Relation to Other Concept

These are number of concepts that are sometimes confused with self-efficacy. These concepts seem to be conceptually similar to self-efficacy. They include the following; academic self-concept, outcome expectations, perceived control (or sense of control), self-esteem.

Academic Self-Concept

The concepts of academic self-efficacy and academic self-concept have been used interchangeably at times. Theoretically and empirically they are different. Self-concept has been defined by Goulao (2014) as beliefs, one's collective self-perceptions that are formed through experiences with, and interpretations of the environment, and which are heavily influenced by reinforcements and evaluations by significant others. In other words, self-concept is a person's view of himself or herself. Whereas academic self-efficacy could be viewed as part of, but not identical to his or her academic self-concept. Self-efficacy is a cognitive assessment of one's capabilities. Academic self-concept includes this, but also includes evaluative and affective components (Bong & Clark, 1999). The evaluative component entails an assessment of ability based more on normative, comparative standard (for example, "can I get as many problems correct as most other students?"), the result then could be in an effective response (for example, "I cannot, so I must be dumb"). Contrary in self-efficacy assessments students are expected to make assessments using absolute standards of success related to the goals of task at hand (for example, "can I answer all of the word problems on the test?").

Pietsch, Walker and Chapman (2003), illustrated in a study that self-concept but not self-efficacy, involves an affective reaction to the evaluation, conducted a factor analysis of items from a mathematics self-concept measure. The self-efficacy items loaded

on the same factor as the items from the competency component of the self-concept measure, but not the affective component of the self-concept measure.

It's important to note that self-concept is usually operational zed using measures that reflect perceived competence more than the affective component of academic self-concept. In other words, self-concept is measured more generally and includes the evaluation of such competence and the feelings of self-worth associated with the behaviors in question (Akomolafe, Ogunmakin, &Fasooto, 2013).

Perceived Control

Perceived control differs from self-efficacy. People that believe the notion that, they can control what they learn and perform, are more apt to initiative and sustain behaviors directed toward those ends then are individuals who hold a low sense of control over their capabilities (Williams&Williams, 2013). In other words, perceived control is a general perception the student has regarding his ability to control how he learns and what outcomes result from the learning. That is, student's sense of control over his/her use of learning strategies, control over the amount of effort expended, and attention control. Thus, it is only one aspect of self-efficacy, there are other factors that influence self-efficacy they include social comparisons, time available, attributions perceptions of ability, and perceived importance.

Outcome Expectations

Outcome expectations is the consequences expected from one's own actions, are related to self-efficacy beliefs but they are not the same. For instance, it is possible that a student could have high self-efficacy the capability to learn mathematics and performs very well in the subject. However, she may also believe that his/her perceived capability will

not earn a good grade in the subject (Mathematics) in class because the teacher hardly gives good grades to girls in mathematics (Pajares, & Schunks, 2001).

Personality Traits

Personality is considered a fairly stable pattern of psychological behavior (thoughts, feelings, and actions) and influences how one will act in response to diverse circumstances (Quinn, Faerman, Thompson, & McGrath, 2003). Personality does not determine behavior; behavior arises in a context, such as work. According to Behrens, Cooper, Ernst, Martins, Myers, Nardi, and Smith, (2001), "personalities reflect the requirements of the contexts as well as our innate tendencies and how we have adapted to these contexts over time". In other words, an individual's behavior is determined by the requirements of the situation. "Efficacy beliefs do not share the major properties ascribed to personality traits" (Behrens et al 2001 p112). While self-efficacy is not considered a personality trait, it is considered a situation-specific construct. This is context dependent and functions as, a "cognitive mediator of action" (Bandura, 1986 p146). "Self-efficacy is a related but subtly different personality characteristic. Self-assessments of ability contribute to self-efficacy but so does the individual's personality" (Griffin, &Moorhead, 2010 p.101). For example, an employee may have a high self-efficacy for performing a job, but due to a personality trait such as shyness, has low self-efficacy for training a new employee to do the same job. According to the self-efficacy theory, the employee would exert more effort on performing the job themselves than on training a new employee on how to perform the job. Bandura (1977) upholds that efficacy beliefs can be changed and that, "psychological procedures, whatever their form, serve as a means of creating and strengthening expectations of personal efficacy". An efficacy expectation is defined by

Loo and Choy (2013) as, "the conviction that one can successfully execute the behavior required to produce the outcomes."

Self-esteem

Self-esteem and self-efficacy are often thought of as being synonymous, however they vary greatly. Self-efficacy differs from self-esteem in that it's a judgment of specific capabilities rather than a general feeling of self-worth (Beck, 2008). For example, an employee may have low self-efficacy for training a new employee, but this will not cause any negative feelings of perceived self-worth. Even though the two concepts are different, they are connected. The philosophy behind Bandura's Triadic Reciprocal Determinism I, that all determinants of motivation are functionally dependent, interacting and influence one another (Bandura, 1997). Therefore, an individual who has high self-efficacy and is successful in most of the tasks he/she undertakes will most likely develop high self-esteem. Alternatively, self-esteem could also influence self-efficacy. "It is true, however, that people tend to cultivate their capabilities in activities that give them a sense of self-worth. If empirical analysis are confined to activities in which people invest their sense of self-worth, they will inflate correlations between self-efficacy and self-esteem, because the analysis ignore both domains of functioning in which people judge themselves inefficacious but could not care less and those in which they feel highly efficacious but take no pride in performing the activity well because of its socially injurious consequences" (Bandura, 1997; p. 125).

Equity

Self-efficacy theory utilizes an important construct of equity theory. Like equity theory, motivation can be influenced by how an individual perceives themselves when compared to another. The difference between the two theories is that equity theory

illustrates that an individual's motivation is influenced by the perceived equality of input/output ratios of the comparison- other, where in contrast, self-efficacy theory predicts that an individual's motivation can be influenced by the positive/negative vicarious experiences of the comparison-other. In truth, both theories have been proven to be correct.

VIE Theory

The expectancy theory, also known as the VIE (expectancy, instrumentality, and valence) theory, is based on the beliefs that an individual's effort will lead to performance, which in turn, will lead to a specific outcome. Comprehensively, self-efficacy is based on an individual's belief about their ability to perform specific behaviors. Expectancy theory explores how towards affect motivation, whereas self-efficacy explores how beliefs about capabilities affect motivation. According to Lunenburg (2011), "People take action when they hold efficacy beliefs and outcome expectations that make the effort seem worthwhile. They expect given actions to produce desired outcomes and believe that they can perform those actions. To successfully achieve the desired outcome, individuals must possess the necessary skills as well as a buoyant self-belief that they are capable of controlling the specific situational factors (Razmefar, 2014). People with high self-efficacy are more likely to respond with renewed effort (expectancy) when feedback shows that they are not reaching their goals by developing more successful strategies (Smith, &Hitt, 2005). However, individuals with low self-efficacy, given the same circumstances, may perform poorly because their low self-efficacy impairs their motivation and effort. For example, an employee with high self-efficacy and ability for performing a job, but low self-efficacy for training a new employee will most likely be an inadequate trainer. On the whole, perceived self-efficacy can be distinguished as being competence-based, prospective, and action-related as opposed to related ideas that only share some these elements (Lunenburg, 2011).

2.2.6 Relationship of Self-Efficacy and Academic Achievement

A huge amount of research has attempted to identify important factors to student success by assessing the relations among many psychological and academic variables. Few studies have used different methods to propose and test models that can be used to understand the relations among factors that influence student academic success (Schunk, 1991; Momanyi, Ogoma, Misigo, 2010& Nakazawa, 2011).

Education has a broad Aim of preparing students for useful living within the society and developing in students' skills and knowledge that would make them function effectively in the society.

In line with Mbathia (2005) who sees education as a mean that supplies people with specific skills and therefore it enables them to perform their tasks effectively. Mbathia further stress that the better the performance of an individual is the more competitive and rewarded the individual is the more competitive and rewarded the individual will be. Many factors have greatly influenced academic achievement of individuals. Researcher like Owiti (2001) describes, attitude leads to achievement and abilities are needed for successful performance. Similarly, Lunenberg (2011) confirmed that intellectual capability and motivation are significant factors on academic performance.

Self-efficacy refers to personal confidence in one's abilities for a successful accomplishment of a certain task as (Razmefar, 2014) put it. Razmefar concluded that, self-efficacy influences behavior, choice and commitment in a task, the energy spends in performing it, and the level of the performance.

Furthermore, Bandura, (1989; p. 73), asserts that the apparent dynamic is that self-efficacy beliefs are "not simply inert predictors of future behaviors"; rather individuals with more efficacious beliefs "makes things happen". Children who believe that they are

capable to carry out a task, indeed they succeed as they will be able to expand their effort on a given task and continue to cope with a difficult task. Students with a high level of self-efficacy attempt tasks and keep up trying even though tasks might be difficult. On the other way, students who are confronted with a variety of attitudes towards themselves and their capabilities would fail, they most of the times end up giving up easily because they have low level of self-efficacy. High perception of self-efficacy individuals, normally are not afraid of situations, choose high level goals, and do more in homework. They tend to employ much effort and persistence in a task that will lead to success cause to increase in their confidence and would go up the motivation of these people, and next situations they will start new behaviors with a belief that they are able to success (Bandura & Schunk, 1981). This conclusion is supported by researchers (Pintrich &DeGroot, 1990; Schimitt& Deshon, 2010; Schunk, 1995; Pajares, 2000).

In a related research finding, the impact of motivational factors on different levels of educational attainment in students in terms of scholastic aptitude and age in different culture was investigated by Fouladchang & Latifian (2003). Result suggests an immediate impact of self-efficacy on academic achievement and it has a positive relationship with academic achievement in mathematics (Teimurifard, 2009).

Motivational strategies enable students to organize their own learning and in turn direct effects on their perception of academic performance. Researchers reveal and confirm that self-efficacy beliefs contribute to academic success as well as performance in other domains. When a student reviews his academic performance and is determined that he was underactive in his performance, these shortcomings will be motivating factor in his self-efficacy, and self-efficacy in turn could select the right strategies and as a result lead to an optimum performance (Zimmerman &Martinez Pons, 1990).

For example, Bandura, Adams and Beyers (1997; p. 137) reported that when individuals develop coping strategies "perceived self-efficacy influences level of performance by enhancing intensity and persistence of effort". Williams and Williams (2010) confirmed "high congruency between self-efficacy and behavior on the level of individual performance task". Bandura, (1997; p. 112) reported this in their work with athletes "adds support to the idea of a reciprocal relationship between successful performance and self-efficacy". Similarly, in another research, the role of perception of self-efficacy for learning self-regulation and its impact on academic achievement in a sample of high school students were investigated, and this result obtained that whatever self-efficacy and self-regulation is greater, the test scores of students will be higher (Burman, Greene,& Shanker, 2015).

Razmefar (2014), In examining the relationship between self-efficacy and academic achievement, examined and verified using simple correlation coefficients, it was observed that the correlation coefficient between self-efficacy and achievement is 478/0 that is significant level 05/0<P, in order words, the more effective the efficacy of person, higher is his achievement. It can be said that people who have high levels of self-efficacy face hard works as competitions for being master and mastery, not as threats to stay away and avoid them, they set competing goals for themselves, maintain a strong commitment to these goals, despite the failure, they develop efforts and they continue to their endeavors, they attribute failure to insufficient effort or deficient knowledge of the skills and inefficient and they face with critical and dangerous situation ensuring that they have control over such situations. On the other hand, those who have low level self-efficacy and they doubtful about their abilities, and they avoid difficult tasks which they see as threats, they

have low enthusiasm and poor commitment towards the goals of their works and they rely on their personal flaws and inefficiencies and the results of their incompatibility.

The conclusion of the above researches cited therefore reinforced that mastery experience are the most influential and can further establish the strongest effects occurring in activities that are most similar to those which self-efficacy has been improved.Academic Self-efficacy has been defined "as personal judgments of one's capabilities to organize and execute course of action to attain designated types of educational performance" (Zimmerman, 1995, p. 203).

Umaru (2010) defines self-efficacy as "the judgment of personal capacity to perform a specific and prospective task. Self-efficacy refers to the beliefs in one's capability to organize and execute the courses of action required to manage prospective situations.

Academic Self-efficacy promotes academic achievement directly and indirectly by increasing academic aspirations andpro-social behaviors (Bandura, Babaraneli, Caprara&Pastorelli, 1996). In the academic realm, self-efficacy belief has received increasing attention in such areas as academic motivation and self-regulation (Pintrich&Schunk, 1995). Self-efficacy is related only to performance expectations and does not depend on the value placed on the task (Hawthrone, 2004). Similarly, Redmond (2013) observed that it is possible to have high self-efficacy about a capability that one does not particularly value as well as the reverse.

Zimmermanand Martinesz-pons, (1990) found out that self-efficacy is an important predictor of student achievement. The more specific and skill-related the self-efficacy measure is, the more predictive it is likely to be for performance achievement. Many other researchers have reported a direct positive relationship between academic self-efficacy and

academic achievement by defining academic self-efficacy as the beliefs of students in their abilities and confidence to master academic subjects (Chemers, Hu &Garcia, 2001).

Furthermore, (Pajares, 1996; Pajares&Schunk, 2001) confirmed strong relationship between self-efficacy and academic achievement. Moreover, researchers have demonstrated that self-efficacy perceptions of several aspects of behaviors that are important in learning choice of activities, efforts, persistence are also good predictors of reasonable generalized performances such as obtained grades (Zimmerman, & Martinez-Pons, 1990). In the same way, Adeyemo (2001) reports that students curricular option was influenced by self-efficacy, likewise, self-efficacy has been found to consistency predict academic achievement (Bong,& Clark, 2008) because of the fact that it has significant effect on effort and persistence. Students who demonstrate greater senses of self-efficacy are more likely to initiate necessary effort necessary for achieving a desired outcome and persist longer when facing academic challenges. In addition, Nejad, (2001) explained further that exerting more effort and persistence in a task that will lead to success will increase in their confidence and would go a long way to motivate the people, and in next situations they will show new behaviors with a belief that they are able to succeed.

Self-efficacy predicts intellectual performance better than skills alone, and it directly influences academic performance through cognition. Self-efficacy also indirectly affects perseverance (Bandura, 1997; Multon, Brown & Lent, 1991). Although past achievement raises self-efficacy, it is student interpretation of past successes and failures that may be responsible for subsequent success. Perceived self-efficacy predicts future achievement better than past performance (Bandura, 1986; Schunk, 2005; Miller, et al, 1996; Chemers, & Garcia, 2001). Self-efficacy beliefs also contribute to performance since they influence thought processes, motivation, and behavior. Fluctuations in performance

may be explained by fluctuations in self-efficacy. For example, varying beliefs in self-efficacy may alter task outcome, whether it involves two similarly-skilled individuals or the same person in two different situations (Bandura, 1997).

Individuals high in self-efficacy attempt challenging tasks more often, persist longer at them, and exert more effort. If there are failures, highly efficacious individuals attribute it to a lack of effort or an adverse environment. When they succeed, they credit their achievement affects the outcome rather than their actual abilities (Schunk, 1995). "Those who regard themselves as inefficacious shy away from difficult tasks, slacken their efforts and give up readily in the face of difficulties, dwell on their personal deficiencies, lower their aspirations, and suffer much anxiety and stress. Such self-misgivings undermine performance" (Klassam& Lynch, 2007). Conversely, individuals with high self-efficacy frequently persevere despite difficult tasks or challenging odds and often succeed because perseverance usually results in a successful outcome (Schunk& Zimmerman, 2006). Numerous studies (Bandura, 1997; Pintrich&DeGroot 1990; Chemers et al, 2001; Pajares, 1996) link self-efficacy to academic achievement. For example, in seventh grade Science and English Classes, self-efficacy was positively related to cognitive engagement and academic performance (Schunk, 2005). Self-efficacy, self-regulated learning, and test also were found to be the best performance predictors (Schunk, 2005).

In a meta-analysis of 39 studies from 1977 to 1988, positive and statistically significant relationships were found among self-efficacy, academic performance, and persistence for a number of disciplines (Multon, Brown & Lent, 1991). Out of the studies analyzed, 28.9% involved higher education. Four factors affected the link between self-efficacy and academic performance. One factor was the time period when the two were assessed. A stronger relationship resulted post-treatment meaning that experimental

manipulations to change self-efficacy beliefs were successful not only in raising self-efficacy but in enhancing academic performance for low-achieving students. A study (Greene & Miller, 1996) found a positive correlation between perceived ability, learning goals, and meaningful cognitive engagement which then influenced academic achievement in college students enrolled in educational psychology. Additional analysis supported this causal model of perceived ability and learning goals leading to meaningful cognitive engagement which then led to academic achievement (Miller et al, 1996). They cautioned that the variables of rewards and penalties, strategies, and other self-regulatory activities, not specifically addressed by their study, could have influences on achievement (Miller et al, 1996). One criticism of their research is they measured achievement by only using one midterm exam score from the course. Also, they administered their instrument immediately before students took the midterm exam. Test anxiety may have affected the outcome.

In two studies conducted (Miller et al, 1996) perceived ability was the best predictor of achievement for high school math students. According to numerous studies, cognitive skills, modeling, feedback and goal-setting together affected self-efficacy beliefs that, in turn, affected performance (Schunk, 1991). Student-held beliefs affected the amount of effort and perseverance they engaged which subsequently influenced achievement (Pajares, 1996).

Many studies support a link between self-efficacy and academic achievement, especially for junior and high school students. The connection is less clear in higher education with some studies supporting a connection and others not finding one.

Self-Efficacy Theory states that the combination between the four factors of developing self-efficacy and three assessment processes used to interpret self-efficacy will determine the level of self-efficacy which directly affects the performance outcomes. The

three assessment processes for self-efficacy are the analysis of task requirements, attribution analysis of experience, and assessments of personal and situational resources/constraints (Gist, Schuwerer, & Rosen, 1989;& Mitchell, 1993).

Academic achievement depends fully on the three assessment processes of self-efficacy. And they are as follows;

Analysis of Task Requirements: This is the amount of determination that a student has to do whatever it takes to perform/complete a task.

i) Student belief to accomplish the task
ii) How much time and effort is dedicated to the course work
iii) The quality of notes that are taken

Attribution Analysis of Experience: This is the personal perception and understanding that a student has in regards to why they accomplished a specific performance level.

i) Was there enough time put into completing the task at hand – Did the time spent or lack thereof affect the outcome?
ii) Was there enough energy put into completing the task at hand – Did the student do minimal work or go above and behind to get the end result?
iii) Was there enough communication between student and professor if there were questions and/or concerns regarding the materials – Did asking or not asking affect the outcome?

Assessment of Personal and Situational Resources/Constraints: This is the student's consideration of personal and situational factors that may affect their education.

i) Quality and quantity or work could be affected by surrounds, environment and emotions – Where is studying occurring? Is the student surrounded by calm or chaotic individuals and/or environment?

ii) Does the student feel comfortable and confident in completing all tasks at hand?

iii) Is the student taking courses at a level in which they can succeed? Are they taking courses that are too easy or too difficult for their skill level and abilities (Mitchell; 1993)?

2.2.7 Other Variables that Can Influence the Development of Academic Self-Efficacy andAcademic Achievement

According to Schunk, Henson,& Cox (1987), many variables can influence the development of academic self-efficacy and academic achievement. These include:

i. Familial influence on self-efficacy

ii. Peer influence

iii. Transitional influence

iv. Self-efficacy learning and achievement

Familial Influence on Self-efficacy

With reference to familial influence on self-efficacy and academic achievement, Fouladchang and Latifian (2002), explain that the beginning in infancy, parents and care givers provide experiences that differentially influence children's self-efficacy. The authors explain that the interactions of family members and those that are concerned with taking care of children, plays an important role on the child self-efficacy. Home influences that help children interact effectively with the environment positively affect self-efficacy (Bandura, 1997; Schunk, Henson, & Cox, 1997). Early sources of self-efficacy are centered in the family, but the influence is bidirectional. Parents who provide a suitable environment that stimulates youngsters' curiosity and allows for mastery experiences help to build children's self-efficacy. Likewise, children who exhibit more curiosity and exploratory activities promote parental responsiveness.

Interesting activities with rich environments can arouse children's curiosity and offer challenges that can be met, children are motivated to work on the activities and thereby learn new information and skills (Lassiter, 1995). Variations avail much in the home environments, material such as books, computers, and puzzles that stimulate children's thinking. Likewise, parents who invest heavily in their children's cognitive development may spend time with them on learning, other homes that do not have these resources, and adults may also devote little time to children's education.

On the contrary, Fouladchang and Latiifian (2002), parents who provide a warm, responsive and supportive home environment, who encourage exploration and stimulate curiosity, and who provide play and learning materials accelerate their children's intellectual development. Parents are key providers of self-efficacy information. Those parents who arrange variety mastery experiences develop more efficacious youngsters than parents who arrange fewer opportunities (Bandura, 1997), such experiences according to Bandura occur in homes enriched with activities and in which children have freedom to explore.

In respect to vicarious sources, parents who teach children ways to cope with difficulties and model persistence and effort strengthen children's self-efficacy. As children grow, peers become increasingly important because peers provide further vicarious boosts in self-efficacy.

The home environments are also prime sources of persuasive information. Parents who encourage their youngsters help to develop children who feel more capable of meeting challenges (Bandura, 1997). Bandura further assert in his submission that self-efficacy suffers in homes in which novel activities are discouraged.

Peer influence

In relation to peer influence, children's self-efficacy is influence in different ways. One means is through model similarity Schunk, (1991) explains that observing similar others succeed can raise observers' self-efficacy and motivate them to perform the task if they believe that they, too, will be successful. On the other hand, observing others fail can lead students to believe that they lack competence to succeed and dissuade them from attempting the task. Model similarity is potent among children and adolescents because peers are similar in many ways and this development levels, students are unfamiliar with many tasks. That is, if they can do it, I can do it as well. When they see someone succeeding, their own self-efficacy increases; where they see people failing, their self-efficacy decreases. Thus, the process is most effectual when they see themselves as similar to the model and is particularly useful for people who are unsure of themselves.

Peer networks (large groups of peers with whom students associate) are avenue through which peer influence operates. Schunk, Henson, and Cox (1987), assert that students in network tend to be similar to one another. He further explains that it enhances the likelihood of influence by modeling. In a similar way, Bandura (1997), alludes that networks help define students' opportunities for interactions and observations of others' interactions, as well as their access to activities. Network members tend to become more similar to one another, their relationships and discussions between friends influence their choices of activities and friends tend to make similar choices (Berndt & O Keefe, 1992).

In further contribution, Krapp and Lewalter (2001), explained motivational socialization. He said that, peer groups promote motivational socialization changes in children's motivational engagement across the school year are predicted accurately by their peer group membership at the start of the year. Children who are highly connected

motivated groups change positively across the school year, and the less motivated groups change negatively.

Dornbusch,Steinberg and Brown (1996) equally alludes to this fact by pointing out that, students from high school entrance until their senior year found that developmental patterns can influence peer pressure on many activities including academic motivation and performance. Peer pressure rises during childhood and peaks around grade 8 or 9 but then declares through high school. A key time of influence is roughly between ages of 12 and 16, a time during which parental involvement in children's activities declines. Steinberg et al also found that students who begin high school with similar grades but who become affiliated with academically oriented crowds achieve better during high school than do students who become affiliated with less-academically oriented crowd.

Transitional Influence

According to Eccles and Midgley, 1989; Eccles, Midgley and Adler (1984),period of transition in schooling bring additional factors into play that affect self-efficacy. They have reported that, the transition to middle school brings several changes. Elementary students remain with the same teacher and peers for most of the school day, children receive much attention, and individual progress is stressed. Because many elementary schools typically feed into the same middle school and because students changes classes, middle school students are exposed to peers.

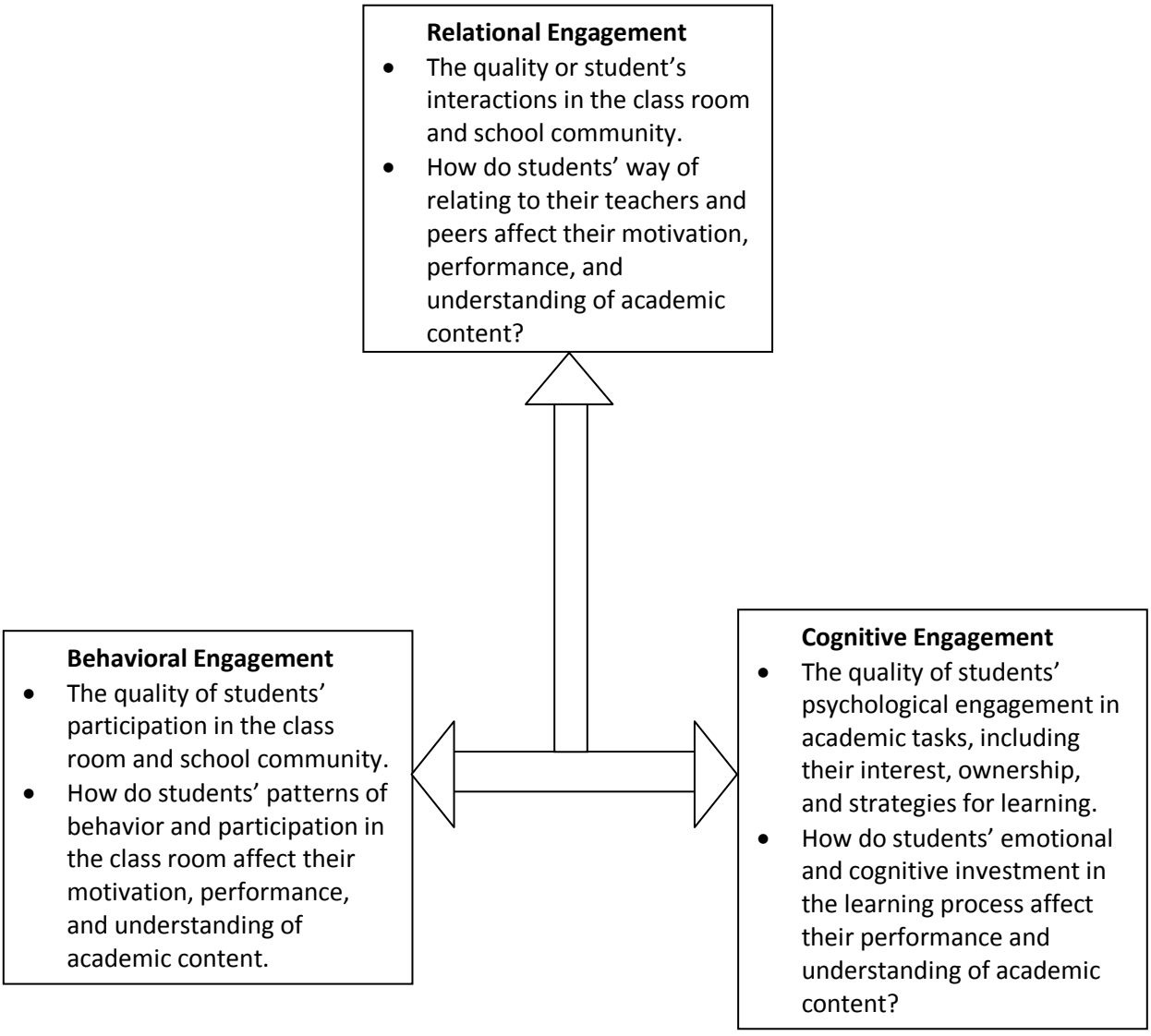
2.3 Concept of Cognitive Engagement

The definition of engagement is complex. Engagement is a growth- producing activity through which an individual allocates attention in active response to the environment (Csikszentmihalyi, 1990). Mark, (2000) refers to engagement as the quality of effort students expend on educationally purposeful activities that contribute directly to

desired outcomes. Newman, Wehlage, and Lamborn (1992), viewed engagement generally as students' psychological investment of effort in learning, understanding, and mastering the knowledge, skills, crafts that academic work intend to promote. They try hard to learn what school offers, understands the materials and incorporating or internalizing it in their lives. Based on this, Newman asserts that students who are engaged are involved in their own learning. In line with Metallidou, and Vlachou (2007) who posit that, for a truly engaged learner, the joy of learning inspires a persistence to accomplish the desired goals even in the face of difficulty. Engagement ocurs on multiple levels. Appleton, Christenson, and Furlong, (2008).Fred ricks, Blumenfeld, and Paris, (2004), assert that there's considerable variation in the definitions of engagement. Generally, engagement is seen as a multidimensional construct, there is variation in both the dimensions and the number. Some researchers argue for two dimensions that is, behavioral and emotional (Voelkl, 1993; Voke, 2002 & Beck, 2008), and other researchers argue for three (3) dimensions that is, behavioral, emotional, and cognitive (Fred ricks, Blumenfeld, & Paris, 2004).

From all these definitions, engagement have resulted in differences in the content of items used in instruments even within the same data set, researchers at times use different variables to operationalize engagement often without conceptual framework guiding the choice of indicators. Similar items have sometimes been used to assess different dimensions of engagement. For example, student effort is used by some to describe the degree of psychological investment in learning (cognitive engagement) and by others to reflect basic compliance with school work (behavioral engagement) student valuing of school has been used as part of both emotional and cognitive engagement scale. Figure2.2below clearly described the interconnected dimensions.

Figure 2:The three (3) interconnected dimensions: Behavioral Engagement



However, for this study, focus will only be on one component (one-dimensional approach), that is Cognitive engagement.

Researchers, policy makers and educators are focusing more on cognitive engagement as the key to addressing low achievement, student boredom and alienation, and high drop rates (Fred ricks, Blumenfield, & Paris, 2004). That is, the importance of engagement in the world of learning cannot be over emphasis, as cognitive engagement in school activities promotes academics achievement and improves student performance and increases positive expectations about academic abilities. (Blumenfield, Kempler, &

Krajack (2096) as school teachers seek to increase engagement, it is important for them to understand how it has been defined and to assess the options for measuring it.

Cognitive engagement is defined as "the integration and utilization of student motivation and strategies in the course of their learning". (Guthrie, 2000, &Wig field, 1996, p. 306; Wang &Eccles, 2013)

Researchers have studied aspects of cognitive engagement, such as students' investment in learning, perseverance in the face of challenges, and use of deep rather than superficial strategies. Some have also included self-regulation (the extent to which students demonstrate control over their learning actions) as a component of cognitive engagement (Pintrich&DeGroot 1990; Miller et al 1996; Mark, 2000; Wang&Eccles 2013).

Cognitive engagement is defined as the extent to which students are willing and able to take on the learning tasks at hand. This includes the amount of effort students are willing to invest in working on the task (Corno&Manadinach, 1983; Fredricks 2004), and how long they persist (Richardson & Newby 2006; Walker, Greene, &Mansell 2006; DeBacker & Crowson, 2015). The researcher therefore, is adopting (Corno&Manadinach 1983); (Richardson & Newby 2006; Walker, Greene & Mansell, 2006).Similarly, a broad definition of cognitive engagement is that it consists of two elements; mental effort and engaging materials.Mental effort in cognitive engagement can be defined as the employment of students' cognitive in learning voluntarily (Hancock & Mueller 2001; Hemlo- silver 2004; DeBacker&Crowson, 2015). Engaging materials refers to the tasks (Hu&Bentler 1999), the classroom activities (Meece, Blumenfield& Hoyle, 1988; Wang &Eccles, 2013), or the learning subject that requires mental efforts (Hancock, & Mueller 2004). From the definition above, one can decline that, cognitive engagement represents

the mental strategies as well as the motivation that the students use while solving the given cognitive task in their learning.

Cognitive engagement is defined as the students' level of investment in learning. It includes being thoughtful in the approach to school tasks and being willing to exert the effort necessary to comprehend complex ideas or master difficult skills (Fred ricks, Blumenfeld& Paris; 2004; Mecceet al. 1988).

Cognitive engagement is a matter of students' will that is, how students feel about themselves and their work, their skills and the strategies they employ to master their work (Metalidou&Viachou, 2007). Student who learn effectively are known by their teachers. This student may be behaviorally engaged but not cognitively engaged. For example, students appear to be working on the task at hand doesn't mean they are learning. It is very important to note that effort is involved in both behavioral and cognitive definitions of engagement. Cognitive engagement therefore, can be referring to the quality of students' engagement whereas sheer effort refers to the quantity of their engagement in the class (Pintrich, 2003; Dupeyat & Marine, 2005).

Cognitive engagement inclusion, depicts an important distinction between students' effort to simply do the work and effort that is focused on understanding and mastery (Fredrick et al; 2004; Greene, Miller, Crownson, Duke, &Alley, 2004).

Students who are cognitively and behaviorally engaged will attend to the task at hand and simultaneously manage their learning (like thinking about similar tasks they have done, realizing when they need to ask for help, using problem-solving strategies).

2.3.1 Relationship between Cognitive Engagement and Academic Achievement

Numerous studies have linked student engagement with improved academic performance and it has repeatedly demonstrated to be a robust predictor of achievement and behavior in schools (Appleton, Christenson, & Furlong, 2008; Shernoff& Schmidt, 2008; Wang&Eccles 2013; DeBacker&Crowson 2015).

Cognitive engagement includes a student's perceptions and beliefs associated to school learning (I will do well in this class if I try). It refers to the cognitive processing a student brings to academic tasks as well as the amount and type of strategies a student utilizes (Walker, Greene, &Man sell, 2006; Wang &Eccles, 2013).

Cognitive engagement in the classroom can be characterize as a psychological state in which students put in a lot of effort to truly understand a topic and in which students persist studying over a long period. It is the extent to which students are willing and able to take on the learning task at hand. This includes the amount of effort students are willing to invest in working on the task (Corno&Mandinach 1983; Fredrick et al 2004), and how long they persist (Richardson &Newby, 2006; Walker, Greene, Mansell, 2006).

Achievement is related to the cognitive strategies that students use to learn. Based on the influential "level of processing", and subsequent "elaborative processing" theory (like, Anderson &Reder, 1979; Craik &Lockhart, 1972; Garcia&Pintrich, 1994; Wang &Eccles, 2013; Atherton, 2011) believe that the use of different types of strategies results in different learning outcomes, and, thus, different levels of achievement. Strategies that involve meaningful (like, elaborative) processing attempt to connect or integrate new information with existing knowledge in an effort to form a richer, more coherent mental representation (Briggs, 1999; DeBacker&Crow son 2015).

Deep/Meaningful Processing

Meaningful processing leads to deep learning and deep learning require that learners relate new ideas and concepts to previous knowledge and experience. It requires that learners integrate their knowledge into interrelated conceptual systems, look, for patterns and underlying principles, evaluate new ideas, and relate them to conclusions. Deep learning also, requires that learners understand the process of dialogue through which knowledge is created, and examined the logic of an argument critically so as the learners will reflect on their own understanding and their own process of learning (Atherton, 2011).

Shallow/ Surface Processing

Shallow processing strategies (rote processing), such as underlining or mechanically reading the new information, produce a less elaborate memory representation, limiting the retrieval and general ability of the information. Learners treat course materials as unrelated to what they already know, and as disconnected bits of knowledge, they memorize facts and carry out procedures without understanding how and why, having difficulty making sense of new ideas that are different from what they encountered in the textbooks and treat these facts and procedures as static knowledge, handed down from an all-knowing authority and end up memorizing without reflecting on the purpose or on their own learning strategies (Garcia & Pintrich, 1994).

Research has consistently found that meaningful processing strategies leads to greater performance on achievement measures over the materials studied than shallow strategies –student's achievements is therefore, positively influenced by their cognitive strategies they employ to guide their learning (like, Atherton, 2011; Greene &Miller, 1996; Kardash &Amlund, 1991; Miller, Greene, Montako, Ravindran,&Nicholls, 1996; Pintrich &Garcia, 1991).

2.3.2 Cognitive Engagement and Academic Self-Efficacy

Research has reliably shown that self-efficacy is positively correlated with measures of meaningful (deep) cognitive strategies that students use to learn. Cognitive interpretations of successes and failures influence subsequent self-efficacy beliefs (like, Schunk, 1991; Arabzadeh et al. 2012).

Meaningful processing strategies have been reported to lead to greater performance on achievement measures over the materials studied than shallow strategies (Greene & Miller, 1996; Kardash&Amlund, 1991; Craik &Lockhart, 1992). Research has indicated that students' achievement is positively influenced by the cognitive strategies they employ to guide their learning.

Self-efficacy beliefs influence our effort, persistence and the cognitive resources we bring to bear with our world around us. Therefore, the use of different types of strategies will result in different learning outcomes, thus, different levels of achievements. That is, students with higher self-efficacy will experience higher cognitive engagement in classrooms. As rightly confirmed by researchers that the relationship between student achievements, meaningful strategies use and self-efficacy is consistent (Greene & Miller, 1996, &Miller et al. 1993; Akomolafe et al. 2013).

Self-efficacy refers to individuals' beliefs in their ability to produce desired outcomes to succeed in their field of endeavor (Wig field, Byrnes &Eccles, 2006; Li, 2012). It also enhances learning and performance (Bandura 1997; Goulao, 2014). It is the belief in one's own ability influences choice of activities and effort (Schunk&Zimmerman, 2006;Loo & Choy 2013), engagement in the behaviors that are necessary to attain goals (Mark, 2000), academic interest and motivation (Bandura, 1997), as well as growth of cognitive competencies and accomplished achievement (Pajares, 1996; Zimmerman, 2000;Tenaw 2013). Self-efficacy has been found to consistently predict academic

achievement (Bong, & Clark, 2008; Shkullaku, 2013) because of the fact that it has significant effects on effort and persistence. Students who demonstrate greater senses of self-efficacy are more likely to initiate necessary effort necessary for achieving a desired outcome and persist longer when facing academic challenges (Schunk& Zimmerman, 2006;Loo& Choy, 2013).

Self-efficacy is a person's judgment of their capability to organize and execute the course of action required to attain predetermined types of academic engagement. It is concerned not with the skills one has, but rather with the estimation of what one can attain with the skills one currently possesses (Redmond, 2013). Students who are self-efficacious tend to generate and test alternative courses of action when they do not initially achieve success. They perform better in the classroom because of their elevated levels of efforts and persistence and deal more effectively with problematical situations by manipulating the cognitive and emotional processes related to those situations (Redmond 2013). An extensive body of research has shown that self-efficacy is directly proportional to undergraduates' grade point average (GPA) (Betze, & Hackett, 1992) and performance (Kazdin, 1970).

The relevance of self-efficacy in students' learning process is thus undeniable. Self-efficacy is important in enhancing students' comfort levels when facing examinations. In fact, changes in efficacy levels are strongly tied to changes in state of well-being such as burnout and engagement. Indeed, lack of efficacy seems to play an antecedent role in burnout process rather than comprising an integral element of the burnout syndrome (Chemers, Hu,& Garcia 2001; Ugwu, Onyishi & Tyoyima, 2013). Students exercise human agency-through intentionality and self-regulation through self-reaction and self-motivation, and self-effectiveness about their capabilities, the quality of functioning and

the meaning of their life and the paths they choose to take. Efficacy beliefs are the foundation of agency through their impact in the adaptation to our experiences, and their impact on other behavioral determinants (Bandura, 2001). The relationship between self-efficacy and actual academic engagement has been established empirically (Zimmerman, 1995). It has been found to consistently predict academic achievement (Bong,& Clark, 2008) due to its effects on effort and persistence, because students who demonstrate greater senses of self-efficacy are more likely to put forth the necessary effort and persist longer when facing academic challenges (Schunk& Zimmerman, 2006; Loo & Choy, 2013, Akomolefe, Ogunmakin & Fosooto, 2013). It regulates students' functioning in four ways: cognitively, motivationally, effectively and socially. Self-efficacy influences the way people face challenges, and perseverance in the face of adversity and lack of success. Efficacious students are likely to use structures as an opportunity and circumvent structural constraints when necessary for effective cognitive engagement. Thus, it is hypothesized that students' self-efficacy will be related with cognitive engagement.

2.4 Concept of Academic Achievement

Academic Achievement is an important and a special issue upon which all teaching and learning activities are measured using standard of Excellence. Aremu and Adika (2001) rightly confirmed this, by defining academic achievement to refer to the Criterion of Excellence in the world of teaching and learning.

Similarly, in a further contribution, Melirafrouz, and Shahraray (2012) defined the term academic achievement by stressing its importance 'as one of the most important and most objectives criteria to evaluate the effectiveness of training system' i.e., the extent to which a student, teacher or institution has achieved their educational goals. Therefore, Academic achievement is an outcome of education which has a special importance, for the

students, teacher, institutions, and the people around him or her as well as the attainment of success of a student in his school work among his classmates.

Academic Achievement, which is measured by the Examination results, is one of the major goals of a school. Schools are established with the aim of imparting knowledge and, skills to those who go through them and behind all, this is the idea of enhancing good academic achievement. Secondary Education whose aim is to prepared students for useful living within the society and also facilitate individual to achieve success in obtaining results that will facilitate students to higher school in order to obtain higher degree to face different life challenges is faced with lots of problems of high rate of poor performance. Efforts and persistence in a task that will lead to success cause to increase in their confidence and would go up the motivation of these people, and in next situations they will start new behaviors with a belief that they are able to succeed (Razmefar, 2014).

Ward (1996) in her contributions explained how Academic Achievement is commonly measured by examinations or continuous assessment but there is no general agreement on how it is best tested or which aspects is most important procedural knowledge such a skills or declarative knowledge such as facts. This definition is in line with Awofala, Arigbabu, Fatade and Awofala (2013) that school achievement in the classroom activities emphasis relative students' performance and rewards the best performance in his/her competences on task such as test, assignment or home work. Avoseh (1983) confirmed this definition by defining academic achievement as how well an individual has done in his cognitive tasks. Avoseh explains further, that academic achievement is the general ability of students regarding their performance in school subject compared to a specified standard called "Pass Marks". Avoseh refers to this pass mark as relative and can be arbitrarily define as 40% or 50%. In other words, academic

achievement could be described as low or high depending on the level of performance of the learner on an academic task. It is said to be low when a student's performance is below an expected level of accomplishment or high when a student's performance is above an expected level of performance.

Edbule (2004), view academic achievement as the level of performance in a particular field of study, which higher scores indicate better achievement and lower scores reveals poor achievement.

Academic achievement could also be seen as an end product of learning, whole, level and performance are affected by various conditions existing at the time of learning as well as the conditions intervening between learning and use (Odinko, 1999).

Odinko, (op sit) further highlight that the term academic achievement refers to the performance or accomplishment of students in academic or learning task. It is used to indicate the degree of success attained in some general or specific area of academic task. In other words, Academic Achievement is an educational outcome of students learning at the end of a course.

Students' academic activities and achievements are increased by their self-efficacy. This submission has been confirmed by Zimmerman and Bandura, (1994), that academic achievement involves self-efficacy belief of students, which can regulate their learning.

2.4.1 Factors Affecting Academic Achievement.

Several Researches have been conducted to determine factors affecting academic achievement of Secondary School Students. Studies have confirmed that, motivation is an important psychological factor that directly influences students' achievement (Dowson &Melnarney, 2003). In line with Barker (2004) described motivation as an important psychological factor that positively influences students' achievement.

Students' personality characteristics, like socio-psychological variables have been confirmed to be good predictors of academic achievement (Abe, 1995; Umoinyang, 1998; &Odinko, 1999). These socio-psychological variables include self-concept, self-esteem, self-confidence, self-regulation, self-efficacy, cognitive engagement and so on. Individual difference in academic achievement has been linked to differences in intelligence and personality. (Von Stumm, Hell, Chomorro-Premuzic, Tomas, 2011). Student with higher mental ability as demonstrated by IQ test and those who are higher in conscientiousness (linked to effort and achievement motivation) tend to achieve highly in academic settings. A recent meta-analysis suggested that mental curiosity (a measured by typical intellectual engagement) has an important influence on academic achievement in addition to intelligence and conscientiousness (Von Stumm et al, 2011).

Children's Semi-structured home learning environment transitions into a more structured learning environment when children start first grade. Early academic achievement enhances later academic achievement. (Bossaert, Doumen, Buyse, & Verschueren, 2011).Parent's academic socialization is a term describing the way parent's influences students' academic achievement by shaping skills, behaviors and attitudes towards school (Magnuson, 2007).

Magnuson further explains that academic socialization can be influenced by parents, socio-economic status, the environment and discourse parents have with their children. Highly educated parents tend to have more stimulating learning environments.

Lassiter, (1995) sees children's' first few years of life as crucial to the development of language and social skills, and that school preparedness in these areas help students adjust to academic expectancies.

The presence of physical activity is another important enhancer of academic achievement. Studies have shown that physical activity can increase neural activity in the brain functions such as attention span and working memory. (Tomporowski, Miller, David, &Naglieri, 2008)

2.5 Theoretical Framework

2.5.1 Self- efficacy Theory

Social Cognitive Theory covers many topics such as moral judgment and physiological arousal, research that is primarily focused on self-efficacy, or the beliefs regarding one's capabilities of successfully completing tasks or goals (Locke & Latham, 2002). According to Bandura (2005), social cognitive theory takes on an agent-like perspective to change, development and adaptation. Bandura describes an agent as someone who intentionally influences one's functioning and life circumstances; "In this view, people are self-organizing, proactive, self-regulating, and self-reflecting. They are contributors to their life circumstances not just products of them" (Bandura, 2005; p. 1).

Self-efficacy was developed by Albert Bandura's as part of a larger theory, the Social Learning Theory (Pajares, 2009), which has progressed into the Social Cognitive Theory (Pajares, & Schunk, 2001). Social Cognitive Theory was presented by Bandura in response to his dissatisfaction with the principles of behaviorism and psychoanalysis. In these two theories, the role of cognition in motivation and the role of the situation are largely ignored (Bandura, 1977; as cited in Redmond, 2010). "Unidirectional environmental determinism is carried to its extreme in the more radical forms of behaviorism" but humanists and existentialists, who stress the human capacity for conscious judgment and intentional action, contend that individuals determine what they become by their own free choices.

Most psychologists find conceptions of human behavior in terms of unidirectional personal determinism as unsatisfying as those espousing unidirectional environmental determinism. To contend that mind creates reality fails to acknowledge that environmental influences partly determine what people attend to, perceive, and think" (Bandura, 1983; p. 344-345).

Albert Bandura's Social Cognitive Theory emphasizes how cognitive, behavioral, personal, and environmental factors interact to determine motivation and behavior (Crothers, Hughes, &Morine, 2008). According to Bandura, human functioning is the result of the interaction among all three of these factors (Crothers, Hughes & Morine, 2008), as embodied in his Triadic Reciprocal Determinism Model (Wood & Bandura, 1999). While it may seem that one factor is the majority, or lead reason, there are numerous factors that play a role in human behavior. Furthermore, the influencing factors are not of equal strength, nor do they all occur concurrently (Wood & Bandura, 1999).

The Social Cognitive Theory is composed of four processes of goal realization: self-observation, self-evaluation, self-reaction and self-efficacy. These components are interrelated, each having an effect on motivation and goal attainment (Redmond, 2010).

Self-observation

Observing oneself can inform and motivate. It can be used to assess one's progress toward goal attainment as well as motivate behavioral changes. There are two important factors with regards to self-observation: regularity and proximity. Regularity means the behavior should be continually observed, whereas proximity means the behavior should be observed while it occurs, or shortly after. Alone, self-observation is insufficient because motivation depends on one's expectations of outcomes and efficacy (Zimmerman&Schunk, 2001; Loo & Choy 2013).

Self-evaluation

Self-evaluation compares an individual's current performance with a desired performance or goal. It is affected by the standards set and the importance of the goals. Goals must be specific and important; therefore, goals such as, "do your best" are vague and will not motivate. Schunkand Zimmerman (2001; p 76.) state that "specific goals specify the amount of effort required for success and boost self-efficacy because progress is easy to gauge." If one has little regard for his goal, he will not evaluate performance. There are two types of self-evaluation standards: absolute and normative. For example, a grading scale would be an example of a fixed or absolute standard. A social comparison such as evaluating one's behavior or performance against other individuals is an example of normative standard (Zimmerman&Schunk, 2001; Tenaw, 2012). People gain satisfaction when they achieve goals that they value. When individuals achieve these valued goals, they are more likely to continue to exert a high level of effort, since sub-standard performance will no longer provide satisfaction (Bandura, 1989).

Self-reaction

Reactions to one's performance can be motivating. If the progress made is deemed acceptable, then one will have a feeling of self-efficacy with regard to continuing, and will be motivated towards the achievement of their goal. A negative self-evaluation might also be motivating in that one may desire to work harder provided that they consider the goal to be valuable. Self-reaction also allows a person to re-evaluate their goals in conjunction with their attainments (Bandura, 1989; Goulao, 2014). If a person has achieved a goal, they are likely to re-evaluate and raise the standard (goal); whereas, if a person has not achieved the goal, they are likely to re-evaluate and lower the standard (goal) to an achievable goal.

Self-efficacy

One's belief in the likelihood of goal completion can be motivating in itself (Van der Biji&Shortridge-Baggett, 2002). "Self-efficacy refers to people's judgments about their capability to perform particular tasks. Task-related self-efficacy increases the effort and persistence towards challenging tasks; therefore, increasing the likelihood that they will be completed" (Barling& Beattie, 1983, and Axtell& Parker, 2003; p.114).

Self-efficacy beliefs are an important aspect of human motivation and behavior as well as influence the actions that can affect one's life. Regarding self-efficacy, Bandura (1995) explains that it refers to beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations. More simply, self-efficacy is what an individual believes he or she can accomplish using his or skills under certain (Pajares, 2009). Self-efficacy has been thought to be a task-specific version of self-esteem (Lunenburg, 2011). The basic principles behind Self-Efficacy Theory is that individuals are more likely to engage in activities for which they have high self-efficacy and less likely to engage in those they do not (Van der Biji &Shortridge-Baggett, 2002). According to Goulao (2014), people behave in the way that executes their initial beliefs; thus, self-efficacy functions as a self-fulfilling prophecy. For example, Employee "A" has high ability and a great deal of experience in creating graphs, but does not have confidence that he can create a high quality graph for an important conference. Employee "B" has only average ability and only a small amount of experience in creating graphs, yet has great confidence that she can work hard to create a high quality for the same conference. Because of Employee A's low self-efficacy for graph creation, he lacks the motivation to create one for the conference and tells his supervisor he cannot complete the task. Employee "B", due to her high self-efficacy, is highly motivated, works overtime to learn how to create a high quality graph, presents it during the conference, and earns a

promotion. Self-efficacy has influence over people's ability to learn, their motivation and their performance, as people will often attempt to learn and perform only those task for which they believe they will be successful (Lunenberg, 2011).

Judgments of Self-efficacy are generally measured along three basic scales: magnitude, strength, and generality.

1. **Self-efficacy magnitude** measures the difficulty level (e.g. easy, moderate, and hard) an individual feel is required to perform a certain task (Van der Biji&Shortridge-Baggett, 2002; Lunenberg, 2011). How difficult is my class work? Are the quizzes easy or hard?
2. **Self-efficacy strength** refers to the amount of conviction an individual has about performing successfully at diverse levels of difficulty (Van der Biji&Shortridge-Baggett, 2002; Lunenberg, 2011). How confident am I that I can excel at my work tasks? How sure am I that I can climb the ladder of success?
3. **Generality of self-efficacy** refers to the "degree to which the expectation is generalized across situations (Lunenberg, 2011).

The basic idea behind the Self-Efficacy Theory is that performance and motivation are in part determined by how effective people believe they can be (Bandura, 1982; as cited in Redmond, (2010). For example, the theory is clearly illustrated in the following quote by Mahatma Gandhi:

> *"If I have the belief that I can do it, I shall surely acquire the capacity to do it even if I may not have it at the beginning"* – Mahatma Gandhi

According to the Social Cognitive theory, self-efficacy is one of the most important variables that influence the academic performance and achievement. Collins (1982) demonstrated in a clear way the importance of self-efficacy beliefs and skill application on

academic performance. The study showed that people may perform poorly on tasks not necessarily because they lack the ability to succeed, but because they lack belief in their capabilities.

Different researches indicate that the way learners make use of the learning strategies increases their academic achievements (Hwang &Vrongistinos 2002; McKenzie, Gow &Schweitzer 2004; Pressley, Borkowski &Schneider 1987; Yip &Chung 2005; Shkullaku, 2013). Bandura (1989) has also found that the perceived self-efficacy increases academic achievement in a direct and an indirect way, by influencing individuals' goals. Self-efficacy, together with the goals, influences academic performance. Individuals with a high level of self-efficacy assign higher goals to them and exercise more effort and willingness to have them accomplished. Locke and Latham (1990) defined that the more challenging the goals are, the more motivation they stimulate. A high level of motivation and willingness bring about higher academic accomplishments.

Attributes of Self-Efficacy Theory

Constructive Attributes:

1. When faced with a difficult task, people who have high self-efficacy will face the challenge as something to be learned and mastered. Their interest and motivation in mastering the task will drive them to succeed in their difficult, yet approachable goal (Pajares&Schunk, 2001).
2. While striving to complete a challenging task or difficult goal, individuals with high self-efficacy may face failures or setbacks, but they will not give up. Where people with low self-efficacy may decide the task is impossible, people with high self-efficacy strives to develop a higher amount of acknowledges and increases

their effort in order to overcome their failures and setbacks (Pajares&Schunk, 2001).

3. People with high self-efficacy are more likely to set more challenging goals for themselves and be more committed to the goal, which enhances self-efficacy (Bandura, 1995).
4. Researchers have demonstrated the positive effects of self-efficacy beliefs on effort, persistence, goal setting, and performance (Pajares, 2009).

Potential detrimental attribute of Self-efficacy is that very high self-efficacy can sometimes lead to degradation in performance of a particular task. This is because high self-efficacy can lead to overconfidence in one's aptitude, which creates a false sense of ability. Overconfidence can lead to employing the wrong strategy, making mistakes, refusal to take responsibility for mistakes, and rejecting corrective feedback (Bong &Clark, 2001). Overconfidence can also result in lower effort and attention being devoted to the task (Stone, 1994). Verbal and tangible rewards can have both positive and negative effects on self-efficacy depending on the context and environment in which the reward or praise is delivered (Manderlink&Harackiewicz, 1984).

The Self-efficacy theory is related to this study in the sense that it throws more light on how one's capabilities contribute to the individual's ability to organize and effectively carry out given tasks in given situations. In fact, it is the anchor of this study in relation to the relationship between self-efficacy and students' academic achievement as one aspect of the research because of the theory's direct bearing on the concept of self-efficacy. The theory stipulates that an individual's believe in what he/she can do aids performance of assignments and this is relevant to the present study as this study, in one

aspect, examines the relationship between self-efficacy and academic achievement of students.

Self-efficacy, cognitive theory both provides a number of suggestions that can be applied in learning environment. They can be used in almost all school environments, with any task, and any demographic individual. This theory can be applied in a basic form or specific to any organizations. They are cheap, easily attainable, and can be used outside the workforce as well. Efficacy believes can be changed depending on the particular circumstance, the task, or an individual prior experience (Pajares, 2009). This can be attractive to organization because it can be applied to any type of individual regardless of background or work history. Self-efficacy theory suggests that increasing the self-efficacy of students will boost motivation and performance. This basic idea behind this theory is that motivation and performance are determined by how successful people believe how they can be (Bandura, 1982). This is extremely useful in the school setting because students can develop improved self-efficacy beliefs in their work by focusing on the four primary sources (Bandura, 1977, Gist & Mitchell, 1992). Utilizing the sources of self-efficacy (performance outcome, vicarious experiences, verbal persuasion and emotional arousal) can improve students, efforts, persistence, goal setting and performance on specific tasks. Applying vicarious experiences can be as simple as a waitress shadowing another experienced server or an apprentice learning his trade. Verbal persuasion can be used by showing praise for a job well-done or by giving positive feed-back on a specific task. Verbal persuasion can be used at any time and requires almost no efforts.

According to Bandura social cognitive (learning) theory, an important source of motivation comes through the many links between goal setting and self-efficacy. Teachers can begin by setting up small, basic goals leading up to larger, more difficult ones in order

for the students to develop beliefs of efficacy as each one that is successfully completed (Bandura, 1982). For example, if a new student is assigned an extremely difficult task, the student will likely experience self-doubt, stress, and threat of performing an unfamiliar task, resulting in an unsuccessful performance. However, if they are assigned a simple task and are able to experience initial success, with more difficult task being introduced slowly they are building high self-efficacy along the way (Bandura, 1982). These tasks are example of performance outcome which are the significant sources, used to develop self-efficacy. As stated by Bandura (1988) competencies are superbly developed when, "modeling is combined with guided practice and success experiences". According (Bandura1982) cited in (Lunenburg), 2011, self-efficacy affects both learning and performance in students in the following ways:

1. Self-efficacy affects the goals that students choose. For example, students with low levels of self-efficacy are more likely to set lower goals for themselves than students with higher self-efficacy.
2. Self-efficacy impacts learning as well as the efforts students exert on the task at hand. For instance, when students have high self-efficacy they are more likely to work harder to learn a new task as they will be more confidence than a student with low self-efficacy.
3. Self-efficacy will influence the persistence for which a person will attempt to learn a new and difficult task. Students who are high in self-efficacy are thought to be more confidence and there-fore will persist in their efforts when learning a new task even when encountering a problem. Thus, these theories will be a guide to this study.

2.5.2 Motivational Systems Theory

According to McClelland (1953) in Balarabe (2004), motivation is seen as constituting desires, needs and interest that arouse activities on organism which direct it toward specific goals and can arise from either intrinsic or extrinsic factors. The person will have to have the needed motivation to initiate and maintain activity, has the needed skill to construct and execute pattern of activity, needed biological structure and functioning to enable the person support skills and motivational components and lastly a responsive environment to facilitate progress toward a goal.Based on this submission, it is assumed that goals, emotions, and personal agency belief (like, beliefs that one has control over learning the activity) work together to guide decision making, including to support caring behavior.

Ford (1987) argues that caring behavior, what we might label as an important aspect of relational engagement, provides a strong motivational foundation for cognitive and behavioral engagement in school context. In other words, students who care for each other and perceive that they are in a caring environment are motivated to engage cognitively and behaviorally.

Theoretically, the personal goals most relevant to caring behavior are four integrative social relationship goals: belongingness, social responsibility, equity and resource provision(Nicholls, 1994). Students who are able to work successfully toward these goals typically say that caring for and about others is always, or almost always, important. This therefore, important for educators to be aware of each of these social relationship goals and to help students meet their relatedness needs in the classroom in order for them to be optimally engaged in the learning process (Furrer & Skinner, 2003).

Due to the numerous studies of motivation during the twentieth century, many theorists have produced their own definition of motivation. Hull (1943) defined motivation

as “the initiation of learned or habitual patterns of movement of behavior.” Megginson (1953) proposed that “the study of motivation is the study of why people do things; why they behave in a certain way; why they conform to a certain pattern.” Beck (1978) stated that, “Motivation is broadly concerned with the contemporary determinants of choice, persistence, and vigor of goal-directed behavior.” Mitchell (1993) said that, “Motivation [represents] those psychological processes that cause arousal, direction, and persistence of voluntary actions that are goal directed.” Balarabe (2004) believe that “when we discuss motivation, we are primarily concerned with (1) what energizes human behavior; (2) what directs or channels such behavior; and (3) how this behavior is maintained or sustained.” According to Bandura (1991) “Motivation is a multidimensional phenomenon indexed in terms of the determinants and intervening mechanisms that govern the selection, activation, and sustained direction of behavior.”

While reviewing past research on motivational behavior, work validating the majority of the motivational theories was found to be well documented. Self-efficacy theory (Bandura, 1977), was validated by the works of Bandura (1986) himself, Pintrich, and Schunk (1989). The goal orientation theory was validated by the works of Ames (1987), Locke and Latham (1990), Pintrich and Schunk (1996). Expectancy theory was validated by the works of Eccles (1983, 1989), and Eccles and Wig field (1992, 1994). However, there was no recorded research available to validate Martin Ford’s motivational systems theory.

From available research on motivation and academic performance, it becomes quite evident that motivational constructs do in fact impact the academic performance of students. There are studies documenting the correlation of the Scholastic Aptitude Test, American College Testing (Ward, 1993), Mathematics (Carpenter, 1993; Ward, 1993; Gist,

1996), High School Grade Point Average (Price & Kim, 1976; Carpenter, 1993) and College Entrance examination (Price & Kim, 1976) scores and the performance of college students. Also well documented are studies in the areas of arts and sciences, psychology, philosophy, and natural sciences. Studies documenting the correlation of motivational behavior and the performance of students in a college business environment appear to be nonexistent.

In the Motivational Systems Theory, motivation is defined as the organized patterning of three psychological functions that serves to direct, energize, and regulate goal-directed activity: personal goals, emotional arousal processes, and personal agency beliefs (Ford, 1992). Symbolically this definition of motivation can be represented as a formula of three interacting components:

Motivation = Goals X Personal Agency Beliefs

A direct offspring or subset of Sigmund Freud's theory is Martin Ford's motivational systems theory (MST). This framework focuses on the individual as the unit of analysis, but embeds the individual in the biological, social, and environmental contexts that are crucial to development. MST attempts to describe the development of the whole person-in-context, in much the same way a biologist might describe an individual plant and its relation to its immediate ecological niche, as well as the larger ecosystems in which it resides (Pintrich&Schunk, 1996). Ford proposed a simple mathematical formula that attempts to represent all these factors in one model. The formula for effective person-in-context functioning is:

$$\text{Achievement} = \frac{(Motivation \times Skill)}{Biological\ \ Structure} \times Responsive\ Environment$$

The formula proposes that actual "achievement and competence are the results of a motivated, skillful, and biologically capable person interacting with a responsive

environment" (Ford, 1992). The motivational systems theory does not attempt to replace or supersede any of the existing theories. Instead, it attempts to organize the various motivational constructs from different theories into one model. The main constructs are self-efficacy beliefs, the role of expectancy, and goal orientation. The formula suggests that in any behavior episode, there are four major prerequisites for effective functioning:

1) The person must have the motivation needed to initiate and maintain the activity until the goal directing the episode is attained.
2) The person must have the skill necessary to construct and execute a pattern of activity that will produce the desired result.
3) The person's biological structure and functioning must be able to support the operation of the motivation and skill components.
4) The person must have the cooperation of a responsive environment that will facilitate progress towards the goal (Ford, 1992).

This theory is related to the present study because it has bearing with how skills, biological capabilities couple with the individual's intrinsic and extrinsic drives lead to efficient task performance. In other words, the theory attempts to provide a comprehensive explanation of motivation and proposes that actual achievement and competence are the results of a motivated, skillful, and biologically capable person interacting within a responsive environment. This is the premise of the present study and thus the stipulations of the theory provide a direction for this study.

2.5.3 Achievement Goal Theory

A prominent feature in motivation theory is the role of goals. Goals are defined as the end toward which effort is directed. Stated another way, goals are that which an individual attempt to accomplish. Goal orientation theory (also referred to as Achievement Goal Theory) has been the focus of a great deal of research in education due to the impact that goals are hypothesized to have on students' performance. Goal orientation theorists have defined achievement goals as the reason which one engages in achievement task. Brophy, (2005) defines academic goals as …motives of an academic nature that students use for guiding their classroom behavior. The specific type of goals one sets determines the personal experience one has following success or failure of the task in which one engages. Goal orientation theorists have engaged in attempts to determine the types of goals that are most productive for students and what types of goals result in the cognitive strategies, affective responses, and behaviors which lead to student success.

Goal orientation theory states that students have distinctive orientations towards certain types of goals. The dominant theoretical approach to goal orientation in academic settings is one that distinguished between mastery and performance orientations. The simple distinction between these goal orientations contends that students who set mastery goals focus on learning the material and mastering the tasks at hand. Students who set performance goals are concerned with demonstrating their ability and performance as measured by their relative standing to others' achievements. The distinction between these two different goal orientations has been a major focus in previous research regarding achievement motivation (Ames, 1992; Ames & Archer, 1988; Manderlink & Harackiewicz, 1993; Nicholls, & Maehr, 1980).

Mastery Goal Orientation

Mastery goals have been hypothesized to be the appropriate approach to enhancing learning, increasing self-efficacy, effort, and persistence as well as the goal orientation, which encourages the use of more effective met cognitive and cognitive strategies. Researchers have also used terms such as learning goals (Dweck, 1986) and task-involved goals (Nicholls, 1984) to describe mastery goal orientation. Nicholls and Maehr (1980) referred to task-involved learners as students who focus on mastering the task at hand, not in performing compared to others. Students who focus on mastering the task at hand, not in performing compared to others. Students attuned to learning or mastery goals persist longer on difficult tasks and are more likely to attribute success and failure to internal controllable causes. Students who set learning goals are also more likely to show preference for challenge and academic risk taking (Ames, 1992). These findings are not limited to K-12 Students, but hold true for college students and adult populations as well. Dupeyrat and Marine (2005) found that when adults in continuing education courses displayed mastery goals, there was positive impact on learning outcomes, while adults who displayed performance goals had negative learning outcomes.

When a student is attuned to mastery goals, effort is seen as contributing to success and not as a measure of ability (Middleton & Midgley, 1997). When oriented toward mastery or learning goals students see achievement (success) as learning something new or mastery the task at hand. Elliot (1999) discussed the separation of mastery orientation into approach and avoidance categories. Mastery Approach orientation leads one to attempt to complete the task in order to increase knowledge and Mastery Avoidance orientation causes one to avoid an achievement task due to the sense that one is not capable of successfully completing the task. Brophy (2005) stated that students with a mastery-avoidance orientation “share an emphasis on mastery (with the mastery-approach oriented

student), but engage in the task with an emphasis on avoiding mistakes, failures, or diminution of existing skills". There is very little empirical evidence regarding the impact of mastery-avoidant goals and it may be difficult to distinguish this type of avoidance orientation from Performance Avoidance orientation which is discussed later in this manuscript.

A second distinction Elliot (1999) alluded to in mastery orientation is that of task-referential vs. past-referent orientation. What he does say is that the past-referent oriented student uses past performance as the measure of achievement, and as a scale by which to set new goals. Whereas mastery task-referential orientation refers to measuring one's competence according to whether one has completed or fully understood the task at hand. Therefore, past-referential goals are measured by whether one has improved one's performance or has further developed one's skills or knowledge. One might interpret this orientation as intra-personal competition.

Elliot (1999) have demonstrated that mastery goals to effective cognitive strategies that involve rehearsal, elaboration, and organization, and meta-cognitive strategies that involve activities such as planning, monitoring, and regulating cognition. It is the assumption of the current study that students with a mastery task-referent orientation tend to use a great deal of elaboration and organization of ideas and the meta-cognitive strategies of monitoring and regulating. Students who set mastery past-referent goals also use these strategies, but the mastery past-referent student uses more rehearsal and planning in an attempt to better them in comparison to previous work. In the current study specific items were designed to tap into the two distinctions described above. However, data analyses of the applied measure will not attempt to distinguish the two as separate factors because it may be difficult to separate the two mastery factors due to the fact that items

referring to a tendency to seek challenge, persist longer at challenging task, and trying to improve, relate to both past and task referent mastery. Therefore, in the current measure, a general mastery orientation is captured by one subdue within the larger measure.

Due to the lack of empirical evidence and the difficulty in separating mastery avoidance and performance avoidance, and the combining of the mastery-past referent and mastery-task referent orientations the current focused on the trichotomies' framework of achievement goals proposed by Elliot and colleagues (Elliot, 1999; Elliot & Church, 1997; Elliot &Harackiewicz, 1996). Elliot (1999) provides a review of the historical, theoretical, and empirical reasons to adopt this framework. The trichotomies' framework focuses on the distinctions between mastery, performance-approach and performance avoidance goals.

Performance Goal Orientation

Performance goals are based on measuring competence in comparison to others. Performance goals lead students to attempt appearing competent or to avoid appearing incompetents when compared to others (Dweck, 1988; Dweck&Leggette, 1988, Elliot &Dweck, 1988). In contrast with student with a mastery orientation, students are attuned to performance goals are more apt to become frustrated and defensive in the face of failure and attributes success and failure to more external factors such as luck, task difficulty, and an uncontrollable lack of ability (Dweck, 1986).

Several researchers have examined the circumstances in which performance goal orientation leads to higher achievement (see Brophy, 2005 for a review). This review of goal theory makes a distinction between performance-approach and performance-avoidance goals. Student who is performance-approach oriented view themselves as having a good deal of ability and wish to measure themselves against others performance hence, demonstrating their ability. Others have described a similar orientation and have

labeled this orientation Ego-Social orientation (Somuncuoglo&Yildirim, 1999). Somuncuoglo and Yildirim stated that ego-social orientation leads to an emphasis on high grades and outperforming others to gain approval and enhance one's self-esteem. Nicholls (1984) stated that individual who are ego-involved and have high self-efficacy seek to demonstrate their ability in comparison to others, while those who are ego-involved and have low self-efficacy avoid demonstrating their lack of ability relative to others. In designing the current measure, performance-approach orientation was operationalized as containing an ego-social component and therefore the subscale contains items that reflect a need to compare one's performance to others and to display success in a social context.

Performance avoidance orientation is grounded in one viewing them-self as lacking ability and therefore wishing to avoid public demonstrations of achievement that would confirm their lack of ability. When students view themselves as lacking ability and hold an entity view of intelligence, they determined their self-worth based on their competence. These students often base their sense of competence on their last grade and never truly build a sense of self-efficacy. In other to protect their self-worth they begin to adopt failure-avoiding strategies. These strategies include weak efforts, avoiding academic risks, setting unrealistically high or low goals, claiming not care and procrastination. Although these individuals adopt these self-handicapping goals, their ensuring failure is consequently attributed to a lack of ability. In the end the failure-avoiding strategies adopted to protect the student sense of self-worth cause the very failure the student was attempting to avoid and eventually lead to failures-accepting behaviors. These students accept that their failures are due to a lack of ability and they can no longer avoid failure.

This theory is related to the present study given the fact that cognitive engagement which is an aspect of this study hinges on students' investment in learning, persistence in

the face of challenges, and use of deep rather than superficial strategies and the extent to which students demonstrate control over their learning actions. Achievement goal theory supports the idea that goals are the reason why one engages in achievement task and one works vigorously (cognitive engagement) to effectively achieve the goals. Since Achievement goal theory cognitive engagement point to the same individual earnest effort and strategies to perform an assigned task, the theory provides insight and direction for the present study.

2.5.4 Engagement Theory

Engagement theory has emerged from the propounder's experiences in teaching in electronic and distance education environments (Appleton, Christenson, & Furlong; 2008; Shneiderman, 1995; Kearsley, 1997). The fundamental idea underlying engagement theory is that students must be meaningfully engaged in learning activities through interactions with others and worthwhile tasks. Therefore, engagement theory is intended to be a conceptual framework for learning and teaching including technology-based learning.

Engagement theory with its emphasis on meaningful learning, it is also very consistent with constructivist approaches, and because it emphasizes collaboration among peers and a community of learners, and can also be aligned with situated learning theories because its focuses on experimental and self-directed learning.

By engaged learning, we mean that all students' activities involve active cognitive processes such as creating, problem-solving, reasoning, decision- making, and evaluation. In addition, students are intrinsically motivated to learn due to the meaningful nature of the learning environment and activities.

Engagement theory is based upon the idea of creating successful collaborative teams that work on ambitious projects that are meaningful to someone outside the

classroom. These three components are summarized as follows: Relate – Create – Donate, imply that learning activities:

1. Occur in a group context (collaborative teams).
2. Are project-based.
3. Have an outside (authentic) focus.

The first principles (the "Relate" component) emphasize team efforts that involve communication, planning, management and social skills. The learning and modern workplace demand s proficiency in acquiring these skills, yet historically students has been taught to work and learn on their own. Research on collaborative learning suggests that in the process of collaboration, students are forced to clarify and verbalize their problems, thereby facilitating solutions. Collaboration also increases the motivation of students to learn, a significant consideration in setting with high dropout rates (like, teenagers, distance learners). Furthermore, when students work in teams, they often have the opportunity to work with others from quite different backgrounds and this facilitates an understanding of diversity and multiple perspectives.

The second principles (the "Create" component) make learning a creative, purposeful activity. Students have to define the problem and focus their efforts on application of ideas to a specific context. Conducting their own projects is much more interesting to students that answering sterile textbook problems. In addition, because they get to define the nature of the project (even if they do not choose the topic) they have a sense of control over their learning which is absent in traditional classroom instruction. Project orientation is the essence of Problem-Based Learning (PBL) approaches, which are often used in medical and other types of professional education (Manderlink &Harackiewicz, 1984).

The third principles (the "Donate" component) stress the value of making a useful contribution while learning. An activity that fits into a team's occupational or concern interest. The authentic learning context of the project increases students' motivation and satisfaction. This principle is consistent with the emphasis on school-to-work programs in many schools' systems and colleges, as well as the "Service" philosophy of contemporary corporate training efforts (Jacoby&Associates, 1996).

Engagement theory is different from many older models learning in which the emphasis was on individualized instruction and interactivity. Engagement theory does promote interaction, but human interaction in the context of group activities, not individual interaction with an instructional program. Engagement theory places a great deal of emphasis on providing an authentic (meaningful) setting for learning.

In conclusion, engagement theory which synthesizes many elements from past theories of learning, the major premise is that students must be engaged in their coursework in order for effective learning to occur. The theory posits three primary means to accomplish engagement:

4. An emphasis on collaborative effort.
5. Project based assignments, and
6. Non-academic focus.

It is suggested that these three methods result in learning that is creative, meaningful, and authentic.

This theory is closely related to the present study for different reasons. First, students' cognitive engagement as it relates to academic achievement is an aspect of this study and atheory like engagement theory directly related to the concept is interesting. Engagement theory presupposes that for students to be learn effectively, they must be

meaningfully engaged in learning activities through interactions with others and worthwhile tasks. This leads to effective performance of given tasks. The theory gives a more lucid and comprehensive understanding of the variables of the present study. The engagement theory is the basis of this research in relation to the aspect the thesis that has to do with the relationship between students' cognitive engagement and academic achievement.

2.6 Review of Empirical Studies

This part deals with relevant review empirical findings reported by different researchers, which are relevant to the topic at hand. The review highlighted findings among the following variables. Academic self-efficacy versus academic achievement, cognitive engagement versus academic achievement, academic self-efficacy versus cognitive engagement, and relation of relevant demographic variables of the study.

2.6.1 Academic self-efficacy and Academic Achievement

The study of Tenaw (2013) investigated the level of students' self-efficacy, gender difference in self-efficacy and achievement and relationships between self-efficacy and achievement for second year students in the fall of 2013 in Analytical Chemistry I (ACI) at DebreMarkos 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 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 training specifically in the field of chemistry were forwarded.

Tenaw's study, though significant in its own right is limited in number of participants involved in the study as well as restricting self- efficacy and achievement test to analytical chemistry, which make the generalization of results questionable. This present study thus seeks to fill this gap by involving more participants and other subject areas.

In a study conducted by Shkullaku (2013), gender differences in self-efficacy and academic performance among Albanian students from two major universities in Tirana, Albania were explored. The data was collected from 180 students (102 females and 78 males) selected from first, second and third level studies. Both universities and participants were selected randomly. A questionnaire was used to measure self-efficacy and the grade point average GPA of the first semester to measure the academic performance of the participants. The data was analyzed using descriptive and inferential statistics. The Pearson correlation coefficient was used to see the relationship between self-efficacy and academic performance. T-test was used to compare male and female participants in self-efficacy and academic performance. The results of the study showed that there was a significant difference between males and females in self-efficacy. There was no difference between males and females in academic performance. Also, a significant relationship was found between the students' self-efficacy and academic performance. From the findings, it was recommended that different authorities as lecturer or counseling services at the universities have to improve students' self - efficacy and to support them to face academic requirements with high level of self-esteem.

The study of Motlagh (2011)and his colleagues investigated the relationship between self-efficacy and academic achievement in high school students. In the study, 250 students in the academic year 2010/2011 were selected by means of multistage cluster sampling and completed self-efficacy scale. To measure achievement score grade point average in classes was used. To analyze data correlation coefficient and regression analysis was used. Analysis of data revealed that self-evaluation, self-directing and self-regulation are correlated with academic achievement. Among all variables entered in the equation model only self-evaluation and self-regulation entered the regression model explaining 10 percent variance of academic achievement in 2 steps. According to the results, self-efficacy is a considerable factor in academic achievement.

The study of Loo and Choy (2013) examined (a) the correlation of the four hypothesized sources of self-efficacy (mastery experience, vicarious experience, social persuasion, emotional arousal) with academic performance, and (b) the prediction of the main source of self-efficacy that affects academic performance. A 40-item survey measuring sources of mathematics self-efficacy was administered to 178 third-year engineering students. Academic performance, which includes mathematics module grades and cumulative grade point average (GPA) scores, were collated. The results of the present study showed that self-efficacy sources were correlated with mathematics achievement scores as well as cumulative GPA of electronics-related engineering diplomas. More importantly, mastery experience was found to be the main predictor for academic achievements of mathematics and related engineering modules. Finally, suggestions are offered to help curriculum developers in instructional design so as to improve students' engineering academic performance.

Goulao (2014) examined the relationship between the academic self-efficacy of adult learners group in an online learning context with their actual performance. The study aimed to evaluate the relationship between self-concept of a group of students in online context and their academic achievement. Data were collected from 63 students of both genders, with average age of 42 years old, selected from the first years of their undergraduate studies. We analyzed their performance in academic course specifies. An adapted questionnaire was used to measure self-efficacy (α=.908). The data was analyzed using descriptive and inferential statistics. The Pearson correlation coefficient was used to see the relationship between self-efficacy and academic performance. The analysis of the data indicated that students' level of self-efficacy is high (average=45) and a significant relationship exists between self-efficacy and academic achievement (r=0.286, at 0.05 level).

In a study conducted by Li (2012), on the relationship between social science students' attitude towards research methods and statistics, self-efficacy, effort and academic achievement was examined. Self-administered questionnaire was chosen as the primary data collection method and a sample of 153 students from Department of Applied Social Studies in the City University of Hong Kong were invited to complete the survey. After analyzing the data collected, Pearson's correlation coefficient reflected that there was a positive correlation between all the four variables – attitude towards research methods and statistics, self-efficacy, effort and academic achievement. Also, a multiple regression analysis was conducted to estimate the prediction power of attitude and self-efficacy on effort. The result showed that both attitude and self-efficacy could significantly predict effort. However, when another multiple regression analysis was conducted to estimate the prediction power of attitude, self-efficacy and effort on academic achievement, it was

found that effort failed to predict academic achievement. To conclude, in the present study, effort could only be regarded as an indirect factor but not a necessary factor in bridging the relationship between attitude, self-efficacy and academic achievement.

In their study, (Mahyuddin,et al, 2011) conducted a study on the relationship between students' self-efficacy and their English language achievement in Malaysia, English is a second language but since 2003, English is the medium of instruction for mathematics and science subjects for year one, form one and form six students. Based on this scenario, it is therefore pertinent to find out whether performance in the English language is largely determined by their perceived English language efficacy. A descriptive-correlational study was conducted on 1,146 students from eight secondary schools in the Petaling district, Selangor. The instruments used to measure self-efficacy were the Self Efficacy Scale developed by Bandura (1995) and the Self Efficacy Scale developed by Kim and Park (1997). The findings showed that 51 percent of students had high self-efficacy while 48 percent showed low self-efficacy. Correlational analysis showed positive correlations between several dimensions of self-efficacy that is, academic achievement efficacy ($r = 0.48$, $p = 0.001$); other expectancy beliefs ($r = 0.34$, $p = 0.005$); and self-assertiveness ($r = 0.41$, $p = 0.005$) with academic performance in English language. In conclusion, achievement in English language will improve when students have high self-efficacy in the language. The implications are discussed in relation to teaching and learning within the school settings.

In another development, the study of Carroll et al., (2009) investigated the structural relations among self-efficacy, academic aspirations, and delinquency, on the academic achievement of 935 students aged 11 to 18 years from ten schools in two Australian cities. The Children's Self-Efficacy Scale, Adapted Self-Report Delinquency

Scale (Revised), and Children's Academic Aspirations Scale were administered to participants prior to academic achievement being assessed using mid-year school grades. Structural equation modeling was employed to test three alternative models for the relationships from academic, social, and self-regulatory efficacy on academic achievement. A partial mediation model showed the best overall fit to the data. Academic and self-regulatory efficacy had an indirect negative effect through delinquency and a direct positive effect on academic achievement. Academic and social self-efficacy had positive and negative relationships, respectively, with academic aspiration and academic achievement; however, the relationship between academic aspiration and academic achievement was not significant in the final model.

Moustafa, Abd-Elmotaleb, Sudhir, and Saha (2013) conducted a study that examines the mediating influence of academic self-efficacy on the link between perceived academic climate and academic performance among university students. The participants in the study consist of 272 undergraduate students at the University ofAssiutAssiut Egypt. A scale to measure perceived academic climate, was developed. To ensure this scale was both reliable and valid we used Cronbach's alpha test. We relied on Landry's category "self-efficacy for academic achievement" from the College Student Self-Efficacy Scale (CSSES) to assess academic self-efficacy participants' GPAs were used as a measure of academic performance. Descriptive statistics, (person product Moment Correlation, t-test as well as simple and multiple regressions) were used to analyze the data. The results demonstrated that perceived academic climate and academic self-efficacy significantly correlated with students' academic performance. The mediating effect of academic self-efficacy on the relationship between perceived academic climate and students' academic performance was also established. It is worth mentioning that academic self-efficacy

mediated the relationship between perceived academic climate and academic performance in the theoretical schools' sample (Full mediation), male and female samples (partial mediation). In contrast, it could not mediate this relationship in the practical school sample. On the basis of the findings, it was recommended that academic self-efficacy should be enhanced using counseling strategies.

2.6.2 Cognitive engagement and Academic Achievement

Greene, Miller, Crowson, Duke and Alley (2004) conducted a study aimed at predicting high school students' cognitive engagement and achievement in relation to contributions of classrooms perceptions and motivation. Path analysis was used to test predictions of a model explaining the impact of students' perception of classroom structures (tasks, autonomy support and mastery and evaluation) on their self-efficacy, perceptions of the instrumentality of class work and their achievement goals in a particular classroom setting. Added to it, the impact of self-efficacy, instrumentality and goals on students' cognitive engagement and achievement was tested. There were 220 high school students who completed a series of questionnaire over a three month in their English classes. Data strongly supported the model demonstrating that students' perceptions of classroom structures are important for their motivation.

Similar results were obtained whenSeadaghat, Abe din, Hejazi and Hassanabadi(2011) carried out a study was to test predictions of a model explaining the impact of motivational factors include perceived ability, perceived instrumentality, achievement goals on cognitive engagement and academic achievement. Participants were 1371 junior year high school students from 19 public high schools distributed across Tehran. They were selected through random cluster sampling and completed a series of questionnaires. Students' academic achievement scores were gathered 3 months after

questioning. Data was analyzed by software LISREL 8.54 and the results strongly supported the model demonstrating that perceived ability, perceived instrumentality and achievement goals predict cognitive engagement and academic achievement.

Wang and Eccles (2013) conducted a longitudinal study adopting a multidimensional perspective to examine the relationships between middle school students' perceptions of the school environment (structure support, provision of choice, teaching for relevance, teacher and peer emotional support), achievement motivation (academic self- concept and subjective task value), and school engagement (behavioral, emotional, and cognitive engagement). Participants were from an ethnically diverse, urban sample of 1157 adolescents. The findings indicated that student perceptions of distinct aspects of the school environment contributed differentially to the three types of school engagement. In addition, these associations were fully or partially mediated by achievement motivation. Specifically, student perceptions of the school environment influenced their achievement motivation and in turn influenced all three types of school engagement, although in different ways. Moderation effects of gender, ethnicity, and academic ability were also discussed.

In their own study, Abbing (2013) investigated the effect of students' engagement on their academic achievement in different stages of their academic career from a dropout perspective through the course of their school careers. This was achieved by measuring the effects of individual components of engagement on the achievement of 1281 students from the Dutch region Twente. Differences in these effects for students of different stages in their career were measured using a moderated regression approach. For every component of the tested engagement model, an effect on achievement could be found, but the kind of effect differed depending on the stage of the students' school career and whether effects on

mathematics or language achievements were measured. The results indicate that in order to understand the relationship between student engagement and achievement, one has to consider the different components of engagement in the context of the students' stage in their school career.

The study of DeBacker and Crowson (2015) proposed and tested a conceptual model of relationships among epistemological variables (epistemological beliefs and need for closure), achievement goals (mastery, performance-approach, performance-avoidance) and cognitive engagement. Two hundred and fifty-nine students attending university in the US volunteered to participate in the study. Students represented a variety of academic disciplines and ranged from 18 to 58 years. The participants completed three paper-and-pencil surveys: The Epistemological Beliefs Inventory; the Attitudes, Beliefs, and Experiences Inventory (a measure of need for closure); and the Approaches to Learning Survey (a measure of achievement goals and cognitive engagement). Structural equation modeling supported the model in general, although not all proposed paths were significant. Correlational analyses further indicated that epistemological beliefs and need for closure are both potentially important variables for understanding learners' treatment of knowledge in instructional settings. There are individual differences in epistemological beliefs and motives that may influence the goals students pursue in learning settings and the nature of their cognitive engagement.

2.6.3 Academic Self-efficacy and Cognitive Engagement

Arabzadeh, Shafy, Salami and Bayanti (2012) examined the effects of teaching self-efficacy on students' cognitive engagement sample fifty (50) high school students, 25 each in experimental and control groups, and the method used was of a random cluster multiple stage sampling type. The measurement tool consisted of Greene and Millers (1996) Cognitive Engagement Questionnaire that was executed as a pretest in both groups. After instruction in self-efficacy for 15 sessions. After administering the pre-test, only the experimental group received. After the treatment, a post-test using the covariance (ANCOVA). The results of the study indicated that the teaching of self-efficacy has had a significant effect on student cognitive engagement. Teaching self- efficacy enables the students to positively employ cognitive strategies and to guide their own learning.

Building on previous research Akomolafe, Ogunmakin, and Fasooto (2013) examined the role of academic self-efficacy, academic motivation and academic self-concept in predicting Secondary School Students' Academic engagement. Three hundred and ninety-eight students constituted the study's sample. Both the independent and dependent variables were measured with relevant standardized instruments. Two research questions were answered in the study. Multiple regression analysis was used to analyze the data collected. The results showed that academic self-efficacy, academic motivation and academic self-concept significantly predicted students' academic engagement and performance. The value of $R = 0.72$ and R^2 (adjusted) = 0.56. The result also showed that 56%of the variance in the academic performance of secondary school students was accounted for by the linear combustion of the three variables. The result was indeed reinforced by the value of F-ratio ($F = 48.06$, $p < 0.05$).In terms of the magnitude of contribution, academic self-efficacy made the most significant contribution to academic engagement and performance followed by academic self-concept and academic motivation

respectively. On the basis of the findings, it was recommended that academic self-efficacy, academic motivation and academic self-concept should be enhanced using appropriate counseling strategies.

All the empirical studies reviewed are relevant to the present study because the studies deal with variables of self-efficacy cognitive engagement and academic achievement, that is gender, age, self-efficacy variables like talent, context and effort. Cognitive engagement variables like psychological investment, effort, deep cognitive strategy use, shallow cognitive processing strategy use, and persistence which are measured in the present study as intervening variables. Some of the designs and methodologies of such studies reviewed will be applied in the present study. Besides, the findings of these studies will provide clue and direction for the current study.

2.7 Conceptual Framework

The conceptual framework map displays the relationships among the independent variables, academic self-efficacy, cognitive engagements and the dependent variable, academic achievement. The independent variable of academic self-efficacy and Cognitive engagement sub-variables include cognitive, deep (meaningful) processing, shallow processing , and persistence, while the dependent variable of academic achievement is connected with the students school records.

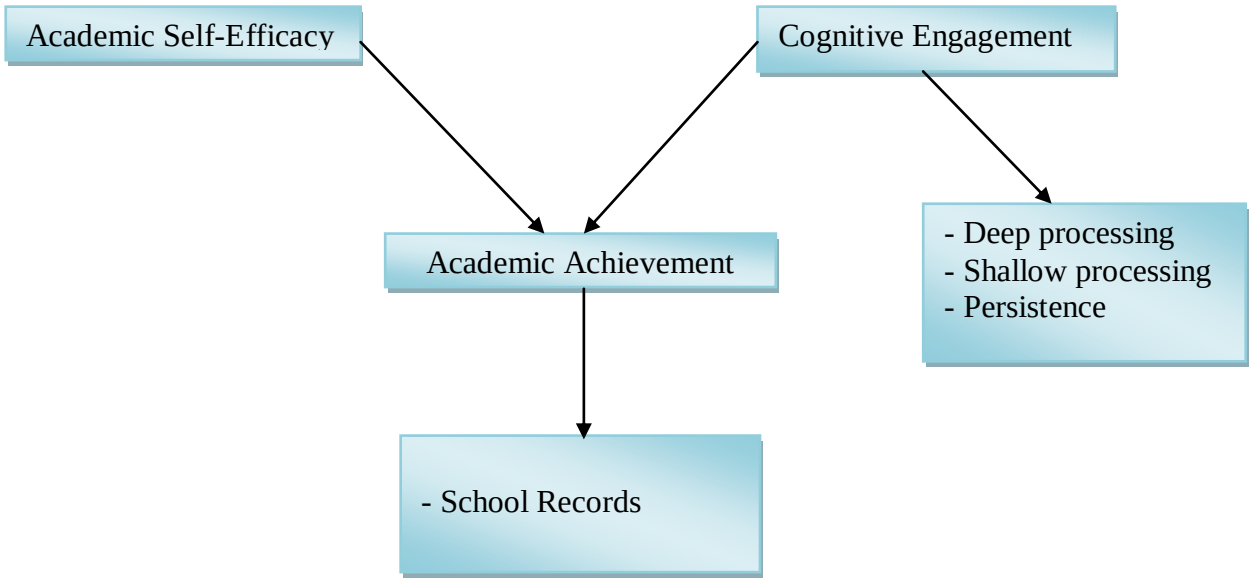


Figure. 3: Conceptual Framework

Source: Researcher's own construct.

The model contains two direct relations and one mediating relation. The first direct relation is between academic self-efficacy and academic achievement. The second direct relation is between cognitive engagement and academic achievement. The mediating relation takes academic achievement as a mediating variable on the relationship between it and academic self-efficacy and cognitive engagement.

2.8 Summary

Literature reviewed for this study, relationship among Academic self-efficacy, cognitive Engagement and Academic Achievement had shown that 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 and if they fail, they attribute the outcome to a lack of effort or an adverse environment. When they succeed, they credit their achievements to their abilities. Inefficacious (low) self-efficacy individuals usually avoid challenging tasks, when they attempt them, they give up more easily. When

inefficacious 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.

Efficacious (high) self-efficacy individuals who have high perception of self-efficacy choose high level goals for themselves because they believe they possess the capabilities necessary to perform the task successfully.

Based on cognitive engagement, researchers have empirically demonstrated that the level of confidence a student has regarding his/her ability to succeed academically is determined by the use of cognitive strategies that translates into higher academic performance which should be meaningful. Meaningfulprocessing is associated with cognitive elaboration of to be learned material, relating new information to one's existing knowledge, thus creating a more complex knowledge strategy.

Shallow processing on the other hand, involves role memorization, basic rehearsal and other types of superficial engagement with the new materials. It will not typically involve connecting new information with existing and integrated knowledge which will not lead to greater performance on achievement measure.

Although literature was reviewed from related researches, the present study is unique in different ways. First, even though previous researches hinged on self-efficacy and other variables of interest, these were carried out in Europe and Asia; few studies on these variables and lack of much literature from our local environment have been reported in Nigeria, an important gap which this study intended to fill. The present study is novel as it dwelt on finding out the relationship among academic self-efficacy, cognitive engagement and academic achievement of secondary school students in the area of study which was not reported in available literature. Even if that have been investigated

elsewhere, which is yet to be captured much in literature in Nigeria in general and in Kaduna state in particular. To add to the uniqueness, variables such as meaningful and shallow processing strategy use, efforts, persistence, ability, as they may affect the effectiveness of learning are part of the investigation in the present study. These were not part of any of the related empirical studies reviewed. The outcome ofthisstudy covers some existing gaps.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter discusses all that the researcher systematically did in order to gather the data needed for this study. The chapter discusses the research design, the population and the sample size. Also discussed in this chapter is the instrumentation, its validity and reliability, procedure for data collection, procedure for data analysis.

3.2 Research Design

Research design for the study wascorrelational design. A correlational design was adopted in this study because all the hypotheses were on relationships. The design investigates one or more characteristics of a group to discover the extent to which the characteristics vary together. This is justified based on the views of Coutinho (2007), Kazak (2010),and Moreano(2004) that when researchers want to find out about relationship between two variables, then correctional design should be used.The design provided all the safeguards prerequisite for confirming and rejecting hypothesis. The design was used to enable the researcher to establish relationship among the variables in the research work. It utilizes scales to obtain data from the respondents.

3.3 Population of the Study

The populationof this studywas made up of all senior secondary school students (SS11) across the twelve (12) Educational Zones in Kaduna State, Nigeria.Thetotal enrolment population figure of (SS11) students of 2015/ 2016 academic session was 48,704, from 385 public senior secondary school in Kaduna State.(Kaduna State Ministry

of Education,2015). (See Appendix X) for the attached list of public senior secondary schools in Kaduna state within twelve (12) Educational zones.

The population distribution of the public senior secondary school students in Kaduna state shown in table 1.

Table1: Distribution ofPopulation of Senior Secondary Schools 11 (SSS 11) StudentsbyEducational Zones in Kaduna State.

Educational Zones	Number of Schools	Total
Anchau	67	4007
Birnin Gwari	13	1067
Giwa	17	2540
Godogodo	24	2733
Kachia	46	2677
Kaduna	23	7354
Kafanchan	36	4404
Lere	22	3140
Rigachikun	20	4016
SabonTasha	42	7917
Zaria	29	6324
Zonkwa	42	2625
Total	**385**	**48704**

Source: Kaduna State Ministry of Education (2015).

3.4 Sample and Sampling Techniques

Multistageand stratified random sampling techniques were employed. Multistage sampling is a complex form of cluster sampling in which the target population is divided into cluster, and then further sampling takes place within eachcluster and so on until

respondents are sampled (Bichi, 2004). Therefore, multistage cluster was applied to divide the state in to four (4) geographical boundaries (Kaduna North, Kaduna South, Kaduna East and Kaduna West); and then the educational zones were shared into these geographical boundaries. On the basis of this, four (4) educational zones were selected randomly (1 representing each geographical boundary), and from each educational zone, four (4) schools were randomly selected which gives a total number of sixteen (16) senior secondary schools out of which, a sample of participant for the study was obtained. The frame of the population was organized into separate strata at the school level. In this case case, population was divided into make and female students. In each stratum a sample of individual participants were selected randomly.

To determine the sample size for this study, Krejcie and Morgan (1970) validated table for determining sample size cited in Martens (2010) was used (see appendix XI). By the table, the sample size for a poplation of 48,704 is 380. The process of obtaining 380 was done through stratified/proportional random sampling technique to draw 213 male participantsand 167 female participants from various schools. This was meant to ensure fair representation of the participant as seen in table2.

Table 2: Distribution ofSample Size of SelectedSchools and the Total Number of Participants.

S/no	Selected schools	Population			Sample Size		
	Giwa Zone (North)	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
1	**GSS Basawa**	179	23	202	17	3	20
2	GSS Gangara	91	21	112	9	2	11
3	GSS Sakadadi	27	10	37	2	1	8
4	GSS Kaurawali	172	58	236	17	6	23
	Kafanchan Zone (South)						
5	GSS Kuryas	57	41	98	5	4	9
6	GGSS Kwoi	-	399	399	-	40	40
7	GSS Kafanchan	234	101	33523		10	33
8	GSS Manchok	75	78	153	7	8	15
	Lere zone (East)						
9	GSS Saminaka	175	144	319	17	15	32
10	GSS Yarkasuwa	212	137	349	21	14	35
11	GSS Gure	104	105	209	10	10	20
12	GSS Lere	153	83	236	15	8	23
	Sabo Tasha Zone (West)						
13	GBSS Barnawa	70	-	70	7	-	7
14	GSS Kakuri	215	264	479	21	26	47
15	GSS Kufana	173	67	240	17	7	24
16	GSS Jere	217	120	337	21	12	33
	Total 16	**2151**	**1657**	**3808**	**213**	**167**	**380**

Source: Kaduna State Ministry of Education, 2015

3.5 Instrumentation

Two instruments and Students' Academic Achievement Scoresused for data collection include:

3.5.1 Morgan Jinks Students Self-Efficacy Scale (1999) (MJSES).

3.5.2 Cognitive Engagement Scale (CES). Greene and Miller's (1996)

3.5.3 Students' Academic Achievement (Scores).End of term's Examination.

3.5.1 Morgan Jinks Students Self-Efficacy Scale MJSES (1999)

Morgan Jinks Students Self-Efficacy Scale (MJSES) is an adapted standardized instrument developed by Morgan and Jinks (1999), used to measure student' self-efficacy.MJSES was developed to gain information about student self-efficacy beliefs that might relate to school success. A version of the scale consisting 30 items was used in this study.

Respondents were asked to indicate the degree of agreement or disagreement with each of the statement. Each degree of agreement is given a numerical score and the respondent total score was computed by summing up these scores. The instrument was designed for a Likert scale response using a five interval scale ranging from Really Agree (1) to Really Disagree (5) as the scoring pattern was shown below:

RA: Really Agree 1

KA: Kind of Agree 2

UN: Undecided 3

KD: Kind of Disagree 4

RD: Really Disagree 5

This means that, a respondent can score a maximum of 150 (5×30) and a minimum of 30score (1×30).

3.5.2 Cognitive Engagement Scale (CES)

Cognitive Engagement Scale was an adapted standardized instrument developed by Greene and Miller's (1996) and was used to measure students' cognitive engagement. The instrument consists of 36 items. It is divided into sub- scales. The sub-scales include: cognitive engagement with 10 items, deep cognitive processing with 11items shallow

cognitive processing 7 items and persistence with 8 items. The response format used for the instrument was a 5-pointLikert‘s scale with option ranging as follows:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree (See Appendix IV&V).

This means, a respondent can score a maximum of 180(36×5) and a minimum of 36 (1×36), that is50 (5×10) on cognitive engagement,55 (5×11) for deep cognitive processing, 35(5×7) for shallow cognitive processing and 40 (5×8) for persistence. The minimum points therefore can be 10, 11, 7, and 8 respectively.

3.5.3 Students Academic Achievement Score

In this research, the researcher used thescoresof terminal examination of the secondary school students (SS1). Three subject scores were used to determine the student’s academic achievement. The subjects include Mathematics, English,and Government/Chemistry/Commerce. Scores in the three subjects were summed up and divided by 3 to get student’s average achievement. (See Appendix VI).

3.5.4 Validity of the Instrument

The Morgan-Jinks Student Efficacy Scale (MJSES) and Cognitive Engagement Scale (CES) were validated through content validity.The adopted instruments whose items were already generated by authors, were given totwo experts in the field of Educational Psychology and Counseling, Ahmadu Bello University including the three supervisors of this thesis. Both were requested to evaluate the contents of the adapted items on the instruments, scrutinized them for face value. Corrections and modifications were made to

ascertain the appropriateness and content coverage with reference to the research objectives.

Previous researchers who have used the scale have reported a high content validity of the scales. For example, Tella, (2003) have reported a high content validity of MJSES with coefficient of 0.82. For cognitive engagement instrument, Greene and Miller (1996) reported a cronbach alpha of 0.76 for cognitive engagement subscale I, 0.77 for deep processing subscale II, 0.74 for shallow processingsubscale III and 0.74 for persistence subscales IV. Their approval of the fitness of the instrument for study was subsequently obtained. The final draft of the instrument is attached to appendix IV and V.

3.5.5 Pilot Testand Reliability of the Instrument

To ascertain the reliability of the instrument since self-efficacy scale and cognitive engagement scale, whichare foreign by their design, a pilot testing was carried out to ensure that the instrument elicit the information required among Kaduna state Secondary school students. The researcher then used 50 SS1 students of Government Secondary School Narayi, Kaduna (outside the selected schools) because they have similar characteristics of the research population. The data collected were analyzed using IBM Predictive Analytic Software (PASW).Then, Spilt-half technique was used to determine the reliability index of the instrument. Overall reliability coefficient of 0.811 for MJSES and 0.777 for CESS. The result of the pilot testing indicates that there is internal consistency of the instrument which gives strong evidence for use in the study. (See Appendix VIII& IX).

For academic achievement score, the reliability is that there is a general acceptable grading scale for secondary school. The researcher therefore used the grading scale which has been certified and is in use in all educational sectors in the country (See Appendix VI).

3.6 Procedure for Data Collection

A letter of permission to carry out the research was obtained from the Department of Educational Psychology and Counseling to Ministry of Education, Educational Research Centre, Educational Zones and Principals of the selected schools in Kaduna State duly signed by the Head of Department introducing the researcher to the management of the ministry.(See Appendix I).

The cooperation of the Ministry of Education, Principals of schools and the participants in the study were sought through transmittal letters that were addressed toexplain the purpose and significance of the study, solicited the participants' cooperation to participate in the study and explained how they would benefit individually and collectively by participating (See Appendix II &III).

The principals of the schools that were selected were informed and they all agreed, granted access to the classes and attachd a staff to provide a lead for the conduct of the study.The instruments were personally administered on the participants with the help of two classroom teachers who served as research assistants. The research assistants were given a brief training for a day geared towards the understanding and the procedure involved before the day of the administration of the instruments proper.

Prior to the process proper, there were social interactions between the researcher and the participants to create familiarization and intimacy for proper understanding. Participants were administered the scale in group settingduring normal class time but in a classroom specifically set aside for the purpose of the study.The participants were

instructed to answer the first instrument Morgan Jinks self-efficacy scale. After that was completely answered, they were asked to answer the second instrument, the cognitive engagement scale. All instruments were answered within a stipulated time of 60 minutes'duration, 30 minutes each for the two instruments in the presence of the researcher and the research assistances. Filledinstruments were retrieved thereafter and participants were appreciated.

3.7 Procedure for Data Analysis

The data collected were analyzed using descriptive and inferential statistics.The statistical techniques are summarized as follows:

Pearson Product Moment Correlation Coefficient (r) was used to test hypotheses 1 to 6, while null hypothesis 7 was tested using Multiple Regression Analysis.To analyze the data,IBM Predictive Analytic Software (PASW) version 24 was used to analyze the data.All hypotheses were tested at 0.05 level of significance.

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction

The purpose of this study was to assess the relationship among academic self-efficacy, cognitive engagement and academic achievement of senior secondary school students in Kaduna state, Nigeria. The study comprises of SS11 students of senior secondary schools in Kaduna state. The chapter is organized along the main variables of investigation. A total of 380 participants were used as sample of the study. The statistical package IBM (PASW) version 24 was used for the analysis.

The research hypotheses were tested using the Pearson Product Moment Correlation Co-efficient. (r) Statistics for hypotheses 1, 2,3,4,5 and 6, Multiple Regression Analysis statistics for hypothesis 7. The summary and discussion of major findings are presented at the end of the chapter. All the hypotheses were tested at 0.05 level significance.

4.2 HypothesesTesting

Seven different null hypotheses were stated which guided this study. In the subsequent sections, all the hypotheses were tested as thus;

4.2.1 Hypothesis One: There is no significant relationship between academic self-efficacy andcognitive engagement of senior secondary school students in Kaduna state.

To test null hypothesis one, the relationship between academic self-efficacy and cognitive engagement of secondary school students correlation analysis using Pearson's *r* was used to test whether significant relationship exists between academic self-efficacy and cognitive engagement. The result is presented in table 4

Table 4 Person Moment Correlation Analysis on the Relationship between Academic Self-efficacyand Cognitive Engagement

Source	*N*	*Mean*	*SD*	*df*	*r*	*p*
Academic self-efficacy	380	82.286	12.929	378	.518**	.000
Cognitive Engagement	380	111.236	13.553			

***. Correlation is significant at the 0.05 level (2-tailed). r^2 = .268*

The result of the Pearson correlation analysis in table 4 between academic self-efficacy and cognitive engagement showed that there is significant positive relationship between academic self-efficacy and cognitive engagement of senior secondary school students in Kaduna state reason being the fact that the p value of 0.000 is lower than the 0.05 alpha level of significance while the r value of .518 (r= .518, p=.000) at 378 df. The r^2statistic for this relationship is .268 which suggests that 26.8% of variance in student's academic self-efficacy can be accounted for by cognitive engagement. Therefore, the null hypothesis which states that there is no significant relationship between cognitive engagement andacademic self-efficacy of senior secondary school students in Kaduna state is rejected.

4.2.2 Hypothesis Two: There is no significant relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna state.

To test null hypothesis two, correlation analysis using Pearson's *r* was used to test whether significant relationship exists between Academic Self-efficacy and Academic Achievement. The result is presented in table 5

Table 5: Person Moment Correlation Analysis on the Relationship between academic self-efficacyand academic achievement.

Source	*N*	*Mean*	*SD*	*df*	*R*	*p*
Academic Self-efficacy	380	82.286	12.929	378	.564**	.000
Academic Achievement	380	44.092	4.759			

***. Correlation is significant at the 0.05 level (2-tailed).* $r^2 = .318$

The result of the pearson correlation analysis in table 5 between Academic Self-efficacy and Academic Achievement showed that there is significant positive relationship between Academic Self-efficacy and Academic Achievement of senior secondary school students in Kaduna statethe outcome shows that the p value of 0.000 is lower than the 0.05 alpha level of significance while the r value of .564 (r=.564, p=.000) at 378 df. The r^2statistic for this relationship is .318, which suggests that 31.8% of variance in student's academic achievement can be accounted for by student's academic self-efficacy. Therefore, the null hypothesis which states that there is no significant relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna state is rejected.

4.2.3 Hypothesis Three: There is no significant relationship between cognitive engagementand academic achievement of secondary school students in Kaduna State.

To test null hypothesis three, correlation analysis using Pearson's *r* was also used to test whether significant relationship exists between Cognitive Engagement and Academic Achievement. The result is presented in table 6.

Table 6:Person Moment Correlation Analysis on the Relationship between cognitive engagementand academic achievement

Source	*N*	*Mean*	*SD*	*df*	*r*	*p*
Cognitive Engagement	380	111.236	13.553	378	.377**	.000
Academic Achievement	380	44.092	4.759			

***. Correlation is significant at the 0.05 level (2-tailed).* $r^2 = .142$

The outcome in thepearson correlation analysis in table 6 between Cognitive Engagement and Academic Achievement of suggests that there is significant positive relationship between Cognitive Engagement and Academic Achievement of senior secondary school students in Kaduna state reason being that the p value of 0.000 is lower than the 0.05 alpha level of significance while the r value of .377(r= .377, p=.000) at 378 df. The r^2statistic for this relationship is .142 which suggests that 14.2% of variance in student's academic achievement can be accounted for by student's Cognitive Engagement. Therefore, the null hypothesis which states that there is no significant relationship between Cognitive Engagement andacademic achievement of senior secondary school students in Kaduna state is rejected.

4.2.4 Hypothesis Four: There is no significant relationship between deep processing and academic achievement of secondary school students in Kaduna State.

To test null hypothesis four, correlation analysis using Pearson's *r* was also used to test whether significant relationship exists between deep processing and academic achievement. The result is presented in table 7.

Table 7: Person Moment Correlation Analysis on theRelationship between deep processing and academic achievement

Source	*N*	*Mean*	*SD*	*Df*	*r*	*p*
Deep Processing	380	18.728	4.054	378	.454**	.000
Academic Achievement	380	44.092	4.759			

***. Correlation is significant at the 0.05 level (2-tailed).* $r^2 = .206$

The outcome of the Pearson correlation analysis in table 7 between deep processing and academic achievement showed that there is a significant positive relationship between deep processing and academic achievement of senior secondary school students in Kaduna state, the pvalue of 0.000 is lower than 0.05 alpha level of significance while r value of .454 (r = .454, p=.000) at 378 df. The r^2statistic for this relationship is .206, which suggests that 20.6% of variance in student's academic achievement can be accounted for by student's deep processing of information. Therefore, the null hypothesis which states that there is no significant relationship between deep processing and academic achievement of senior secondary school students in Kaduna state is rejected.

4.2.5 Hypothesis Five: There is no significant relationship between persistence andacademic achievement of secondary school students in Kaduna State.

To test null hypothesis five, correlation analysis using Pearson's *r* was also used to test whether significant relationship exists between Persistence and Academic Achievement. The result is presented in table 8.

Table 8: Person Moment Correlation Analysis on the Relationship between Persistence and Academic Achievement

Source	*N*	*Mean*	*SD*	*df*	*r*	*p*
Persistence	380	24.152	5.247	378	.211**	.000
Academic Achievement	380	44.092	4.759			

***. Correlation is significant at the 0.05 level (2-tailed). r^2 = .044*

The result of the pearson correlation analysis in table 8 between persistence and academic achievement showed that there issignificant positive relationship between persistence and academic achievement of senior secondary school students in Kaduna state because the p value of 0.000 is lower than the 0.05 alpha level significance while the r value of .211 (r=.211, p=.000). The r^2statistic for this relationship is .044, which suggests that 4.04% of variance in student's academic achievement can be accounted for by student's persistence.

Therefore, the null hypothesis, which states that there is no significant relationship between persistence and academic achievement of senior secondary school students in Kaduna state, is rejected.

4.2.6 Hypothesis Six: There is no significant relationship between shallow processingand academic self-efficacy of senior secondary school students in Kaduna State.

To test null hypothesis six, correlation analysis using Pearson's *r* was used to test whether significant relationship exists between shallow processing and academic self-efficacy. The result is presented in table 9.

Table 9: Person Moment Correlation Analysis on the Relationship between shallow processing andacademic self-efficacy

Source	***N***	***Mean***	***SD***	***df***	***r***	***p***
Shallow processing	380	9.389	3.308	378	.286**	.000
Academic self-efficacy	380	82.386	12.929			

***. Correlation is significant at the 0.05 level (2-tailed). r^2 = .082*

The result of the pearson correlation analysis in table 9 between shallow processing and academic self-efficacyshowed that there is significant positive relationship between shallow processing and academic self-efficacyof senior secondary school students in Kaduna state, the p value of 0.000 is lower than the 0.05 alpha level significance while the r value of .286(r= .286, p.000). The r^2statistic for this relationship is .082, which suggests that 8.2% of variance in student's moderate academic self-efficacylevel can be explained by shallow processing. Therefore, the null hypothesis, which states that there is no significant relationship between shallow processing and academic self-efficacyof senior secondary school students in Kaduna state, is rejected.

4.2.7 Hypothesis Seven: There is no significant relationship among deep processing, Shallow processing and academic achievement of secondary school students in Kaduna State.

To test null hypothesis seven, multiple regression analysis was used to examine whether significant relationship exists among deep processing, shallow processing and academic achievement. The result is presented in table 10.

Table 10: Multiple regression analysis on the Relationship among deep cognitive, shallow and academic achievement.

Model fit: F (2, 379) = 50.016, p = 0.000				*R = .458, R^2 = .210, R^2_{adj} = .206*		
		Unstandardized Coefficients		*Standardized Coefficients*		
Model		*B*	*Std. Error*	*Beta*	*T*	*Sig.*
1	(Constant)	33.636	1.090		30.867	.000
	Deep Processing	.512	.056	.436	9.161	.000
	Shallow Processing	.092	.068	.064	1.344	.180

a. Dependent Variable: Academic Achievement Score

Table 10 shows outcome of multiple regression analysis on relationship among deep processing, shallow processing and academic achievement of senior secondary school students. Result indicates deep processing and shallow processing significantly aid academic achievement of senior secondary school students, critical*F = 3.09 at* (2, 379) = 50.016, p = 0.000, and together account for 21% in senior secondary school students' academic achievement. Individually, DCP significantly contributes to academic performance with a correlation index of .436, t = 9.161, p = .000. In contrast, SCP does not contributes significantly to students' academic performance, t = 1.344, p = .180. The correlation index is .064. Based on this outcome, the null hypothesis seven is rejected as significant relationship exist among the variables.

4.3 Summary of Findings

The data collected for the study were sorted and analyzed using Pearson Product Moment Coefficient(r) and multiple regression analysis on PASW 24 and the result of the analysis shows the following findings;

i. There was a significant positive relationship between academic self-efficacy and cognitive engagement of senior secondary school students in Kaduna state (r = .518, p = .000).

ii. There was a significant positive relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna state (r = .564, p = .000).

iii. There was a significant positive relationship between cognitive engagement and academic achievement of senior secondary school students in Kaduna state (r = .377, p = .000).

iv. There was a significant positive relationship between deep processing and academic achievement of senior secondary school students in Kaduna state (r = .454, p = .000).

v. There was a significant positive relationship between persistence and academic achievement of senior secondary school students in Kaduna state (r = .211, p = .000).

vi. There was a significant positive relationship between shallow processing and academic self-efficacy of senior secondary school students in Kaduna state (r = .286, p = .000).

vii. Deep processing significantly correlate with academic achievement of senior secondary school students, r = .436, p = .000, more than shallow processing, r = .064, p = .180.

The seven null hypotheses generated were tested at 0.05 level of significant. All hypotheses were rejected.

4.4 Discussion of Findings

Relationship between academic self-efficacy and cognitive engagement

The main objective of this study was to find out the relationship between academic self-efficacy and cognitive engagement of secondary school students in Kaduna State. The study finds significant positive relationship between academic self-efficacy and cognitive engagement of senior secondary school students in Kaduna state (r = .518, p = .000).this result corroborates previous findings by Arabzadeh, ShafyNadery, Salami and Bayanati (2012) in their study onthe effects of teaching self-efficacy on students' cognitive engagement. It was reported that teaching of self-efficacy has had a significant effect on student cognitive engagement. Teaching self- efficacy enables the students to positively employ cognitive strategies and to guide their own learning. Similarly, research by Akomolafe, Ogunmakin, andFasooto (2013) on the role of academic self-efficacy, academic motivation and academic self-concept in predicting secondary school students' academic engagement demonstrates that academic self-efficacy, academic motivation and academic self-concept significantly predicted students' academic engagement and performance (r = 0.72, $r^2_{adjusted}$ = 0.56). The result also showed that 56%of the variance in the academic engagement of secondary school students was accounted for by the linear combustion of the three variables. In terms of the magnitude of contribution, academic

self-efficacy made the most significant contribution to academic engagement followed by academic self-concept and academic motivation respectively.

Relationship between academic self-efficacy and academic achievement

Findings also show a significant positive relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna state (r = .564, p = .000). The result found in this study is corroborated by Tenaw (2013) who investigated 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 2013 in Analytical Chemistry I (ACI) at DebreMarkos College of Teacher Education (DMCTE). The study indicated that students' level of self-efficacy is medium (50.08), and there is a statistically significant relationship between self-efficacy and achievement (r= 0.385, p = 0.01). Related findings by Latifian (2003) suggest an immediate impact of self-efficacy on academic achievement and a positive relationship with academic achievement in mathematics (Teimurifard, 2009). Bandura, (1997; p. 137) reported that when individuals develop coping strategies "perceived self-efficacy influences level of performance by enhancing intensity and persistence of effort". Williams and Williams (1982; p.886) confirmed "high congruency between self-efficacy and behavior on the level of individual performance task".Tomporowski, David, Miller, Jack (2008; p. 112) reported this in their work with athletes "adds support to the idea of a reciprocal relationship between successful performance and self-efficacy".

Relationship between cognitive engagement and academic achievement

There is a significant positive relationship between cognitive engagement and academic achievement of senior secondary school students in Kaduna state (r = .377, p =

.000). Other studies have linked student engagement with improved academic performance and it has repeatedly demonstrated to be a robust predictor of achievement and behavior in schools (Appleton, Christenson, & Furlong, 2008; Shernoff& Schmidt, 2008; Abbing 2013; Wang&Eccles 2013; DeBacker&Crowson 2015). For instance, results obtained by Seadaghat, Abe din, Hejazi and Hassanabadi (2011) demonstrates that perceived ability, perceived instrumentality and achievement goals predict cognitive engagement and academic achievement. Also, Abbing (2013) using a moderated regression approach found that for every component of the tested engagement model, an effect on achievement could be found, but the kind of effect differed depending on the stage of the students' school career and whether effects on mathematics or language achievements were measured.

Relationship between deep processing and academic achievement

There is a significant positive relationship between deep processing and academic achievement of senior secondary school students in Kaduna state (r = .454, p = .000).This finding is in line with previous research which consistently found that deep (meaningful) processing strategies leads to greater performance on achievement measures over the materials studied than shallow strategies –student's achievement is therefore, positively influenced by their cognitive strategies they employ to guide their learning. Meaningful processing leads to deep learning and deep learning require that learners relate new ideas and concepts to previous knowledge and experience. It requires that learners integrate their knowledge into interrelated conceptual systems, look, for patterns and underlying principles, evaluate new ideas, and relate them to conclusions. Deep learning also, requires that learners understand the process of dialogue through which knowledge is created, and examined the logic of an argument critically so as the learners will reflect on their own understanding and their own process of learning. (Garcia &Pintrch, 1994; Greene &Miller,

1996; Kardash and &Amlund, 1991; Miller, Greene, Montako, Ravindran, &Nicholls, 1996; Atherton, 2011; Pintrich &Garcia, 1991; Abbing, 2013).

Relationship between persistence and academic achievement

The study also found a significant positive relationship betweenpersistence and academic achievement of senior secondary school students in Kaduna state (r = .211, p = .000).This finding is in line with other researchers' view who more recently, studied aspects of cognitive engagement, such as students' investment in learning, perseverance in the face of challenges, and use of deep rather than superficial strategies. Some have also included self-regulation (the extent to which students demonstrate control over their learning actions) as a component of cognitive engagement (Pintrich&DeGroot 1990; Miller et al 1996; Abbing 2013; Wang &Eccles 2013). They conclude that students who are cognitively and behaviorally engaged will attend to the task at hand and simultaneously manage their learning (like thinking about similar tasks they have done, realizing when they need to ask for help, using problem-solving strategies).

Relationships between shallow processing and academic self- efficacy

There is a significant positive relationship between shallow processing and academic self-efficacy of senior secondary school students in Kaduna state (r = .286, p = .000). This finding is in line with Abbing (2013) previous findings which found that shallow cognitive processing strategies with constant practice leads to greater performance of achievement measures over the material studied. Shallow processing strategies such as role memorization, basic rehearsal, underlining or mechanically reading the new information, with constant practice will enable the students' process information for long term memory retention. Learners treat cost materials as related to what they already know, and asconnected bits of knowledge, they memorize facts and carry out procedures

withunderstanding how and why, and treat these facts and procedures with constant practice and memorization.

Self-efficacy beliefs influence our effort, persistence and cognitive resources we bring to bear with our world around us. Therefore, the use of different types of strategies will result in different learning outcomes, thus different levels of achievement. Students with self-efficacy and shallow cognitive processing will experience higher cognitive engagements in classrooms with effort, persistence (constant practice). As rightly confirmed by researchers that deep cognitive processing strategies used and self-efficacy is consistent (Greene & Miller, 1996, &Miller et al, 1993; Akomolafe et al, 2013).

Outcome also suggested a significant positive relationship between shallow processing and academic self-efficacy of senior secondary school students in Kaduna state (r = .286, p = .000). It suggests that 8.2% of variance in student's moderate level of academic self-efficacy level can be explained by shallow processing of information. This result is in line with Tembo, and Ngwira (2016) study, which was aimed to find out from the medical students if their perceived self-efficacy is related to their use of cognitive learning strategies; second, to assess if, in terms of gender and parent education, differences do exist in their levels of self-efficacy and their use of the cognitive strategies. Using a cross section study, and a pre-tested questionnaire, Motivated Strategies for Learning Questionnaire (MSLQ), results suggested self-efficacy positively predicted both learning strategies of shallow [$\beta = 0.47$] and deep [$\beta = 0.42$]. There were no significant differences between male and female students on both shallow and deep learning strategies, and self-efficacy beliefs ($p < 0.05$). First generation students had higher levels of cognitive learning strategies in both shallow ($p < 0.05$) and deep ($p < 0.01$) learning

strategies. It was concluded that self-efficacy is therefore important for adoption of study habits in medical students with respect to the learning of Anatomy.

Relationship among deep processing, shallow processing and academic achievement

Result also revealed that deep cognitive processing significantly correlate with academic achievement of senior secondary school students, r = .436, p = .000, more than shallow cognitive processing, r = .064, p = .180. This outcome is consistent with previous researches, which suggest that meaningful processing strategies leads to greater performance on achievement measures over the materials studied than shallow strategies – student's achievements is therefore, positively influenced by the cognitive strategies they employ to guide their learning (Greene&Miller, 1996; Kardash &Amlund, 1991; Miller, Greene, Montako, Ravindran&Nicholls, 1996; Pintrich &Garcia, 1991; Abbing, 2013). Similarly, Kim and Freddie (1990) in their study where they examined the impact of deep elaborative versus shallow-reiterative information processing on students' academic performance reported that deep-elaborative students out-performed their shallow-reiterative counterparts in management accounting and accounting information systems courses. It appears that there is a relationship between approach to learning and the learning outcome – those who adopt deep learning achieve higher knowledge and higher grades than shallow learners. Maton and Säljö (1976) conducted a test in which 30 students were instructed to read a newspaper, and then questioned on the content. Outcome showed how well students learned in relation to the level of processing. Chin and Brown (2000) have also demonstrated the benefits of deep learning strategies such as generative thinking; analyzing ideas and relating them to personal experience, compared to surface approaches in school level chemistry. Further, Trigwell and Prosser (1991) provided parallel evidence of the superior effects of deep learning over a whole course, rather than, studies that

incorporate, merely on one academic task. The strategic approach is actually often looked at as an approach to studying rather than to learning as it was derived from research on everyday studying rather than meaning. Hence, it is possible to combine approaches to studying with approaches to learning. A strategic deep approach has been strongly associated with high academic success (Craik & Lockhart, 1992). Despite, robust evidence on the superiority of deep as opposed to surface learning approaches, it has been suggested that there are specific instances in education where surface learning is necessary/efficient. Artherton (2011) highlights higher education subjects where the mere memorization of basic facts or laws is essential before the whole subject can be mastered – for example, law or medicine. However, the impossible role of surface learning later in the study of these subjects is clear. Similarly, in a school context there are instances where rote learning is not only necessary but is effective and information retained for long periods of time – the learning of times tables; memorizing the periodic table or learning the basics of a foreign language (Lublin, 2009). In fact, it might be argued that the acquisition of a second language is based largely on surface learning. Clearly there is a place for surface learning in education and in every day contexts, memorizing phone numbers for example but by large, deep learning is superior.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapterprovides the summary of the study, conclusions drawn from the results of the study, recommendations that could enhance academic achievement of students and suggestions for further researches are also presented in this chapter.

5.2 Summary

The high rate of poor performance among secondary school students in Kaduna State was a thing of concerned to government, school administrators, parents, students, and others. Lack of success because of learning was accounted for by many factors such as student's poor academic self- efficacy and cognitive engagement, which are often neglected during classroom teaching and learning, assessment or evaluation of students' success or failure in examinations. Based on this, the study examines relationship among academic self-efficacy, cognitive engagement and achievement of senior secondary school students in Kaduna State, Nigeria. In line with the research objectives, research questions, null hypotheses, as well as basics assumptions were formulated to guide the study. The specific hypotheses guiding the study were (i) there was no significant relationship between academic self-efficacy and cognitive engagement of senior secondary school students in Kaduna state (ii) there was no significant relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna state (iii) there was no significant relationship between cognitive engagement and achievement of senior secondary school students in Kaduna state (iv) there was no significant relationship between deep processing and academic achievement of senior secondary school students in

Kaduna state (v) there was no significant relationship between persistence and academic achievement of senior secondary school students in Kaduna state (vi) there was no significant relationship between shallow processing and academic self-efficacy of senior secondary school students in Kaduna state. (vii) there was no significant relationship among deep processing, shallow processing and academic achievement of senior secondary school students in Kaduna state.

To achieve the above, previous related literatures were reviewed on the concept of academic self-efficacy, cognitive engagement and academic achievement was captured. The literature also sheds light on the variables ofthe study. The theoretical framework on academic self- efficacy such as self-efficacy theory, motivational theory, cognitive engagement such as engagement theory and achievement goal theorywere critically reviewed as they relate to the study. Moreover, relevant empirical works that relate to the present study were equally reviewed. The study, based on its nature adopted a correlational design. Data for academic self-efficacy and cognitive engagement were collected from three hundred and eighty (380) students using two questionnaires which were validated and approved for use by the department of educational psychology and counseling, ABU Zaria while, students' academic achievement score was collected from their teachers. The questionnaires were pilot tested for validity and reliability. The reliability results have shown 0 .811 and 0 .777 respectively.

5.3 Conclusion

On the basis of the findings of this study, the following conclusions are made. Secondary school student's academic self-efficacy correlate with their cognitive engagement, which implies that as students have increase in their self-efficacy, their desire to employ, manipulate, and control their cognitive strategies in their own learning will also

increase.Student's academic self-efficacy correlate with their academic achievement, which means that students with high academic achievement have high academic self-efficacy. Student's cognitive engagement also correlates with students' academic achievement, which implies that high achievement students are frequently aware of their cognitive strategies. In terms of persistence, shallow and deep processing of learnt materials also correlate with academic achievement of senior secondary school students of Kaduna, Nigeria. Generally, the study concludes based on the result that poor performance of students' can be accounted for by poor students' academic self-efficacy and cognitive engagement of senior secondary school students of Kaduna state, Nigeria.

5.4 Contributions to Knowledge

In assessing relationship among academic self-efficacy, cognitive engagement and academic achievement of students in Kaduna state, It was established that:

i. There was a significant positive relationship between academic self-efficacy and cognitive engagement of senior secondary school students in Kaduna state (r=.518, p = .000).
ii. There was a significant positive relationship between academic self-efficacy and academic achievement of senior secondary school students in Kaduna state (r = .564, p = .000).
iii. There was a significant positive relationship between cognitive engagement and academic achievement of senior secondary school students in Kaduna state (r = .377, p = .000).
iv. There was a significant positive relationship between deep processing and academic achievement of senior secondary school students in Kaduna state (r = .454, p = .000).

v. There was a significant positive relationship between persistence and academic achievement of senior secondary school students in Kaduna state (r= .211, p = .000).

vi. Shallow processing positively correlate with academic self-efficacy of senior secondary school students in Kaduna state (r = .286, *p* = .000)

vii. Deep processing significantly correlate with academic achievement of senior secondary school students, (pr = .536, p = .000), more than shallow processing, (r = .064, p = .180).

5.5 Recommendations

The following recommendations are made based on the findings of the study:

i. Since it was found out that academic self- efficacy was positively and significantly related to students' cognitive engagement, teachers should formulate programs and activities that will develop and maintain self-efficacy among students, develop activities that will also boost their cognitive engagement and interest in their studies. Such academic activities will help improve students' academic achievement. This can be done by the school through organizing seminar and workshops to create awareness on the variables that are neglected during classroom activities so as to improve students' academic self- efficacy and cognitive engagement.

ii. Findings of the study proved that academic achievement was positively and significantly related to students' academic self-efficacy, teachers in senior secondary schools in Kaduna state, Nigeria are required to set high standard, aspirations and expectations for students by evolving programs aimed at encouraging and boosting student's confidence to enhance their academic

achievement. This should be done, by formulating realistic, specific measurable and relevant educational goals for student's environment to build their effort, confidence, and general academic achievement.

iii. The findings of the study proved that cognitive engagement was positively and significantly related to students' academic achievement. Students should be encouraged by their teachers and parents to be meaningfully engaged in learning activities through interactions with others and worthwhile tasks. To achieve meaningful learning, teachers should emphasize on collaboration among peers and a community of learners. They should device activities that involve active cognitive processes such as creating, problem-solving, reasoning, decision- making, and evaluation to enhance cognitive engagement and academic achievement.

iv. Deep processing of information has been found to help students acquire and retain information needed for a successful academic activity in the classroom. It is therefore recommended to teachers to engage students in tasking classroom activities like problem solving which will encourage deep processing of information and consequently enhance academic achievement.

v. Since persistence was found to correlate with students' academic achievement in senior secondary school, teachers and parents should encourage their wards to persist even when faced with daunting academic challenges or failure. Students who persist will benefit in having higher chances of improved academic achievement in school. This can be done by police makers to introduce parents-educational programs in schools to improve parent'sinvolvement in the educative process of their children for better academic achievement.

vi. Although students' who cognitively process information in a shallow manner reported good level of academic self- efficacy, it is recommended that psychologists and counsellors should create awareness, educate, sensitizedand encourage students to process information deeply which would help not only for the sake of writing and passing exams but for long term memory retention.

vii. Since processing information in a deep manner enhance good academic performance in school in contrast to shallow processing, efforts should be made by teachers to encourage deep cognitive processing more than rote learning.

5.6 Suggestions for Further Research

The study was limited to (16) secondary schools within (4) educational zones in Kaduna state, Nigeria.

i. Future studies could be extended to cover other educational zones in the states.

ii. The study should be replicated in other states to see if the same results could be achieved. In addition, future studies could employ a longitudinal survey so that changes in students' academic self-efficacy and cognitive engagement can be monitored for immediate intervention.

iii. It is also suggested that a similar study should be carried out among junior secondary school students who at this level they are starting their secondary education so that changes in students' academic self-efficacy and cognitive achievement can be monitored for immediate intervention and to see if similar result could be achieved.

iv. The study should be extended to examine parent's educational qualification along with their active involvement on students' academic pursuits to see if similar result will be obtained.

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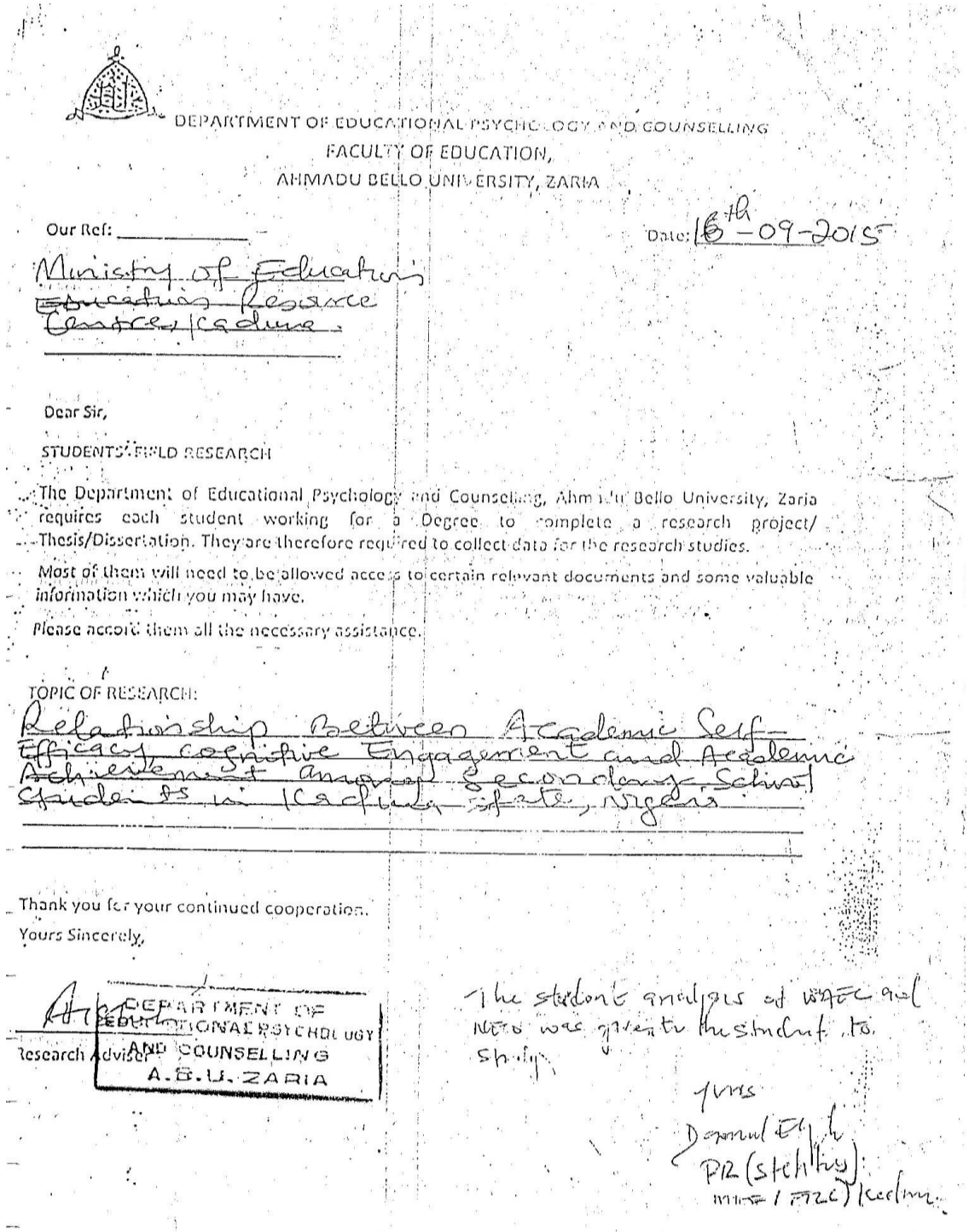
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APPENDIX I



DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND COUNSELLING
FACULTY OF EDUCATION,
AHMADU BELLO UNIVERSITY, ZARIA

Our Ref: _____

Date: 16th-09-2015

Ministry of Education
~~Education~~ Resource
~~Centre~~ Kaduna.

Dear Sir,

STUDENTS' FIELD RESEARCH

The Department of Educational Psychology and Counselling, Ahmadu Bello University, Zaria requires each student working for a Degree to complete a research project/ Thesis/Dissertation. They are therefore required to collect data for the research studies.

Most of them will need to be allowed access to certain relevant documents and some valuable information which you may have.

Please accord them all the necessary assistance.

TOPIC OF RESEARCH:

Relationship Between Academic Self-Efficacy, Cognitive Engagement and Academic Achievement Among Secondary School Students in Kaduna State, Nigeria

Thank you for your continued cooperation.

Yours Sincerely,

Research Advisor

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND COUNSELLING A.B.U. ZARIA

The student's analysis of WAEC and NECO was given to the student to study.

Yours
Dr. Samuel Ekele
PRS (Statistics)
MOE / FRCN Kaduna

APPENDIX II

Dept. of Educ.Psychology&Counselling,
Ahmadu Bello University,
Zaria,

Dear Sir,

RELATIONSHIPS AMONG ACADEMIC SELF EFFICACY, COGNITIVE ENGAGEMENT AND ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN KADUNA STATE, NIGERIA.

I am a postgraduate student of Ahmadu Bello University, Zaria, conducting correlational study on the above topic in partial fulfilment for the award of Ph.D. in Educational Psychology.

I request you to please kindly allow me to use senior secondary school students to give response to the Questionnaire. The Questionnaire involves Questions on students' Academic Self-efficacy, and Cognitive Engagement in schools.

This study will create awareness about the problems faced by students during classroom learning and teaching, by this, all stakeholders of education in the state will see the need to ensure that students are carefully guided and motivated to acquire these psychological variables in teachings and learning activities so as to enhance and develop their self-efficacy and engagement in learning activities in Kaduna state.

Yours faithfully,

Esther Damaris Nathan.

APPENDIX III

Department of Educational
Psychology and Counseling,
Ahmadu Bello University,
Zaria.

Dear Respondent,

RELATIONSHIP AMONG SELF-EFFICACY, COGNITIVE ENGAGEMENT, AND ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN KADUNA STATE, NIGERIA

I am a postgraduate student of Ahmadu Bello University, Zaria. I am conducting a correlational study on the above topic in partial fulfillment of the requirements for the award of Ph.D in Educational Psychology.

I request you to please kindly complete the attached questionnaire meant for the above purpose. I assure you that your responses will be used for this educational purpose only and will be treated confidentially.

It is hope that you will benefit yourself maximally by participating actively in this study.

Yours faithfully,

Nathan, Esther Damaris

APPENDIX IV

MORGAN-JINKS STUDENT EFFICACY SCALE (MJSES). AN INVENTORY SCALE

MJSES)

Jinks and Morgan (1999)

Instruction: In the following question, tick (✓) the option that best represent your opinion.

Key: Really agree (1), kind of agree (2), Undecided (3), kind of disagree (4) and really disagree (5).

S/N	SELF-EFFICACY ITEMS	Really Agree 1	Kind of Agree 2	Undecided 3	Kind of Disagree 4	Really Disagree 5
1	I am a good science student.					
2	Sometimes I think an assignment is easy when other kids think it is hard.					
3	I am a good social studies student					
4	I am one of the best students in my class					
5	My teacher thinks I am smart					
6	I am a good mathematics student.					
7	My classmates usually get better grades than I do.					
8	I usually understand my homework assignments.					
9	I could get the best grades in class if I tried hard enough.					
10	I am good in reading.					
11	It is not hard for me to get good grades in school.					
12	I am smart.					
13	When the teacher asks a question, I usually know the answer even if the other kids don't.					

14	Most of my classmates like to do mathematics because it is easy.					
15	I would get better grades if my teacher liked me better.					
16	I will graduate from senior secondary school.					
17	I attend a good school.					
18	Adults who have good jobs probably were good students when they were kids.					
20	When I am old enough I will go to college.					
21	No one cares if i do well in school.					
22	What I learn in school is not important.					
23	It does not matter if I do well in school.					
24	Kids who get better grades than I do get more help from the teacher than I do.					
25	I will quit school as soon as I can.					
26	Teachers like kids even if they do not make good grades.					
27	It is important to go to senior secondary school.					
28	I work hard in school					
29	Most of my classmates work harder on their homework than I do.					
30	I always get good grades when I try hard					
31	I usually do not get good grades in mathematics because it is too hard.					

Source: Jinks and Morgan (1999)

APPENDIX V

Cognitive Engagement Scales Adopted from Miller et al.

Participants will be asked to respond to each question using a 1 to **5-point Likert Scale.**

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree.

		Strongly Disagree(1)	Disagree(2)	Neutral (3)	Agree (4)	Strongly Agree(5)
1.	When I study for a test, I try to put together the information from class and from the book.					
2.	When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.					
3.	It is hard for me to decide what the main ideas are in what I read.					
4.	When I study I put important ideas into my own words.					
5.	I always try to understand what the teacher is saying even if it doesn't make sense.					
6.	When I study for a test I try to remember as many facts as I can.					
7.	When studying, I copy my notes over to help me remember material.					
8.	When I study for a test I practice saying the important facts over and over to myself.					
9.	I use what I have learned from old homework assignments and the textbook to do new assignments.					
10	When I am studying a topic, I try to make everything fit together.					
11	When I read material for this class, I say the words over and over to myself to help me remember.					
12	I outline the chapters in my book to help me study.					
13	When reading I try to connect the things I am reading about with what I already know.					

14	I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.					

15	I work hard to do well in this class even if I don't like what we are doing.					
16	When work is difficult, I either give up or only study the easy parts.					
17	Even when course materials are dull and uninteresting, I manage to keep working until I finish.					

		Strongly Disagree(1)	**Disagree (2)**	**Neutral (2)**	**Agree(4)**	**Strongly Agree(5)**
18	When studying, I try to combine different pieces of information from course material in new ways.					
19	I draw pictures or diagrams to help me solve some problems.					
20	I work several examples of the same type of problem when studying mathematics so I can understand the problems better.					
21	I work practice problems to check my understanding of new concepts or rules.					
22	I examine example problems that have already been worked to help me figure out how to do similar problems on my own.					
23	I classify problems into categories before I begin to work them.					
24	When I work a problem, I analyze it to see if there is more than one way to get the right answer.					
25	I try to memorize the steps for solving problems presented in the text or in class.					
26	When I study for tests I review					

	my class notes and look at solved problems.					
27	When I study for tests I use solved problems in my notes or in the book to help me memorize the steps involved.					
28	I find reviewing previously solved problems to be a good way to study for a test.					

		Strongly Disagree(1)	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree(5)**
29	If I have trouble understanding a problem, I go over it again until I understand it.					
30	I try to complete homework assignments as fast as possible without checking my accuracy. (R)					
31	If I have trouble solving a problem, I'm more likely to guess at the answer than to look at examples in the book to try to figure things out. (R)					
32	If I have trouble solving a homework problem in the book, I copy down the answer in the back of the book if it is available. (R)					
33	If I have trouble solving a problem, I'll try to get someone else to solve it for me. (R)					
34	When I read something in the book that doesn't make sense, I skip it and hope that the teacher explains it in class. (R)					
35	When I run into a difficult homework problem, I keep working at it until I think I've solved it.					
36	When I run into a difficult homework problem, I usually give up and go on to the next problem. (R)					

KEY:

- **i.** Item 1,2,3,4,5,6,7,10,14 and 17 (Subscale I) Cognitive Strategies
- **ii.** Item 9,12,13,18,19,20,21,22,23,24 and 25(Subscale II) Deep Processing
- **iii.** Item 8,11,26,27,28,30 and 34(Subscale III) ShallowProcessing
- **iv.** Item 15,16,29,31,32,33,35,and 36 (Subscale IV) persistence

APPENDIX VI

STANDARD ACADEMIC ACHIEVEMENT MEASURE

S/N	*GRADING*	*CLASSIFICATIONS*	*REMARKS*
1	A1	75% and above	Excellent
2	B2	74% - 70%	Very Good
3	B3	69% - 65%	Good
4	C4	64% - 60%	Credit
5	C5	59% - 55%	Credit
6	C6	54% - 50%	Credit
7	D7	49% - 45%	Credit
8	E8	45% - 40%	Pass
9	F9	39% and below	Fail

Sources: Adopted from Ministry of Education, (MOE) Standard Grading Scale for Schools.

APPENDIX VII

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Academic Self-efficacy	82.3868	12.92909	380
Cognitive Engagement	111.2368	13.55305	380

Correlations

		Academic Self-efficacy	Cognitive Engagement
Academic Self-efficacy	Pearson Correlation	1	.518**
	Sig. (2-tailed)		.000
	N	380	380
Cognitive Engagement	Pearson Correlation	.518**	1
	Sig. (2-tailed)	.000	
	N	380	380

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

```
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  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Academic Self-efficacy	82.3868	12.92909	380
Academic Achievement Score	44.0921	4.75960	380

Correlations

		Academic Self-efficacy	Academic Achievement Score
Academic Self-efficacy	Pearson Correlation	1	.564**
	Sig. (2-tailed)		.000
	N	380	380
Academic Achievement Score	Pearson Correlation	.564**	1
	Sig. (2-tailed)	.000	
	N	380	380

**. Correlation is significant at the 0.05 level (2-tailed).

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  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Cognitive Engagement	111.2368	13.55305	380
Academic Achievement Score	44.0921	4.75960	380

Correlations

		Cognitive Engagement	Academic Achievement Score
Cognitive Engagement	Pearson Correlation	1	.377**
	Sig. (2-tailed)		.000
	N	380	380
Academic Achievement Score	Pearson Correlation	.377**	1
	Sig. (2-tailed)	.000	
	N	380	380

**. Correlation is significant at the 0.05 level (2-tailed).

```
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  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
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Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Deep Cognitive Processing	18.7289	4.05408	380
Academic Achievement Score	44.0921	4.75960	380

Correlations

		Deep Cognitive Processing	Academic Achievement Score
Deep Cognitive Processing	Pearson Correlation	1	.454**
	Sig. (2-tailed)		.000
	N	380	380
Academic Achievement Score	Pearson Correlation	.454**	1
	Sig. (2-tailed)	.000	
	N	380	380

**. Correlation is significant at the 0.05 level (2-tailed).

```
CORRELATIONS
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  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Persistence	24.1526	5.24723	380
Academic Achievement Score	44.0921	4.75960	380

Correlations

		Persistence	Academic Achievement Score
Persistence	Pearson Correlation	1	.211**
	Sig. (2-tailed)		.000
	N	380	380
Academic Achievement Score	Pearson Correlation	.211**	1
	Sig. (2-tailed)	.000	
	N	380	380

**. Correlation is significant at the 0.05 level (2-tailed).

```
FREQUENCIES VARIABLES=SE1 SE2 SE3 SE4 SE5 SE6 SE7 SE8 SE9 SE10 SE11 SE12
SE13 SE14 SE15 SE16 SE17
    SE18 SE19 SE20 SE21 SE22 SE23 SE24 SE25 SE26 SE27 SE28 SE29 SE30 CSQ1
CSQ2 CSQ3 CSQ4 CSQ5 CSQ6 CSQ7
    CSQ8 CSQ9 CSQ10 CSQ11 CSQ12 CSQ13 EFF1 EFF2 EFF3 EFF4 DCP1 DCP2 DCP3
DCP4 DCP5 DCP6 DCP7 SP1 SP2
```

```
  SP3 SP4 PS1 PS2 PS3 PS4 PS5 PS6 PS7 PS8
/ORDER=ANALYSIS.
```

Frequencies

Frequency Table

I am a good science student.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	139	36.6	36.6	36.6
	Kind of Agree	99	26.1	26.1	62.6
	Undecided	34	8.9	8.9	71.6
	Kind of Disagree	74	19.5	19.5	91.1
	Really Disagree	34	8.9	8.9	100.0
	Total	380	100.0	100.0	

Sometimes I think an assignment is easy when other kids think it is hard.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	153	40.3	40.3	40.3
	Kind of Agree	120	31.6	31.6	71.8
	Undecided	29	7.6	7.6	79.5
	Kind of Disagree	49	12.9	12.9	92.4
	Really Disagree	29	7.6	7.6	100.0
	Total	380	100.0	100.0	

I am a good social studies student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	126	33.2	33.2	33.2
	Kind of Agree	113	29.7	29.7	62.9
	Undecided	21	5.5	5.5	68.4
	Kind of Disagree	84	22.1	22.1	90.5
	Really Disagree	36	9.5	9.5	100.0
	Total	380	100.0	100.0	

I am one of the best students in my class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	212	55.8	55.8	55.8
	Kind of Agree	102	26.8	26.8	82.6
	Undecided	26	6.8	6.8	89.5
	Kind of Disagree	27	7.1	7.1	96.6
	Really Disagree	13	3.4	3.4	100.0
	Total	380	100.0	100.0	

My teacher thinks I am smart

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	188	49.5	49.5	49.5
	Kind of Agree	119	31.3	31.3	80.8
	Undecided	27	7.1	7.1	87.9
	Kind of Disagree	25	6.6	6.6	94.5
	Really Disagree	21	5.5	5.5	100.0
	Total	380	100.0	100.0	

I am a good mathematics student.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	140	36.8	36.8	36.8
	Kind of Agree	138	36.3	36.3	73.2
	Undecided	33	8.7	8.7	81.8
	Kind of Disagree	47	12.4	12.4	94.2
	Really Disagree	22	5.8	5.8	100.0
	Total	380	100.0	100.0	

My classmates usually get better grades than I do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	171	45.0	45.0	45.0
	Kind of Agree	119	31.3	31.3	76.3
	Undecided	15	3.9	3.9	80.3
	Kind of Disagree	44	11.6	11.6	91.8
	Really Disagree	31	8.2	8.2	100.0
	Total	380	100.0	100.0	

I usually understand my homework assignments.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	193	50.8	50.8	50.8
	Kind of Agree	112	29.5	29.5	80.3
	Undecided	20	5.3	5.3	85.5
	Kind of Disagree	44	11.6	11.6	97.1
	Really Disagree	11	2.9	2.9	100.0
	Total	380	100.0	100.0	

I could get the best grades in class if I tried hard enough.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	146	38.4	38.4	38.4
	Kind of Agree	106	27.9	27.9	66.3
	Undecided	28	7.4	7.4	73.7
	Kind of Disagree	61	16.1	16.1	89.7
	Really Disagree	39	10.3	10.3	100.0
	Total	380	100.0	100.0	

I am good in reading.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	169	44.5	44.5	44.5
	Kind of Agree	112	29.5	29.5	73.9
	Undecided	24	6.3	6.3	80.3
	Kind of Disagree	53	13.9	13.9	94.2
	Really Disagree	22	5.8	5.8	100.0
	Total	380	100.0	100.0	

It is not hard for me to get good grades in school.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	201	52.9	52.9	52.9
	Kind of Agree	108	28.4	28.4	81.3
	Undecided	15	3.9	3.9	85.3
	Kind of Disagree	46	12.1	12.1	97.4
	Really Disagree	10	2.6	2.6	100.0
	Total	380	100.0	100.0	

I am smart.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	155	40.8	40.8	40.8
	Kind of Agree	93	24.5	24.5	65.3
	Undecided	17	4.5	4.5	69.7
	Kind of Disagree	70	18.4	18.4	88.2
	Really Disagree	45	11.8	11.8	100.0
	Total	380	100.0	100.0	

When the teacher asks a question, I usually know the answer even if the other kids don't.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	153	40.3	40.3	40.3
	Kind of Agree	120	31.6	31.6	71.8
	Undecided	29	7.6	7.6	79.5
	Kind of Disagree	49	12.9	12.9	92.4
	Really Disagree	29	7.6	7.6	100.0
	Total	380	100.0	100.0	

Most of my classmates like to do mathematics because it is easy.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	9	2.4	2.4	2.4
	Kind of Agree	26	6.8	6.8	9.2
	Undecided	30	7.9	7.9	17.1
	Kind of Disagree	168	44.2	44.2	61.3
	Really Disagree	147	38.7	38.7	100.0
	Total	380	100.0	100.0	

I would get better grades if my teacher liked me better.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	4	1.1	1.1	1.1
	Kind of Agree	15	3.9	3.9	5.0
	Undecided	6	1.6	1.6	6.6
	Kind of Disagree	100	26.3	26.3	32.9
	Really Disagree	255	67.1	67.1	100.0
	Total	380	100.0	100.0	

I will graduate from senior secondary school.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	4	1.1	1.1	1.1
	Kind of Agree	16	4.2	4.2	5.3
	Undecided	11	2.9	2.9	8.2
	Kind of Disagree	115	30.3	30.3	38.4
	Really Disagree	234	61.6	61.6	100.0
	Total	380	100.0	100.0	

I attend a good school.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	6	1.6	1.6	1.6
	Kind of Agree	19	5.0	5.0	6.6
	Undecided	28	7.4	7.4	13.9
	Kind of Disagree	185	48.7	48.7	62.6
	Really Disagree	142	37.4	37.4	100.0
	Total	380	100.0	100.0	

Adults who have good jobs probably were good students when they were kids.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	6	1.6	1.6	1.6
	Kind of Agree	9	2.4	2.4	3.9
	Undecided	17	4.5	4.5	8.4
	Kind of Disagree	124	32.6	32.6	41.1
	Really Disagree	224	58.9	58.9	100.0
	Total	380	100.0	100.0	

When I am old enough I will go to college.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	12	3.2	3.2	3.2
	Kind of Agree	7	1.8	1.8	5.0
	Undecided	15	3.9	3.9	8.9
	Kind of Disagree	118	31.1	31.1	40.0
	Really Disagree	228	60.0	60.0	100.0
	Total	380	100.0	100.0	

No one cares if i do well in school.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	25	6.6	6.6	6.6
	Kind of Agree	40	10.5	10.5	17.1
	Undecided	49	12.9	12.9	30.0
	Kind of Disagree	98	25.8	25.8	55.8
	Really Disagree	168	44.2	44.2	100.0
	Total	380	100.0	100.0	

What I learn in school is not important.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	169	44.5	44.5	44.5
	Kind of Agree	106	27.9	27.9	72.4
	Undecided	22	5.8	5.8	78.2
	Kind of Disagree	40	10.5	10.5	88.7
	Really Disagree	43	11.3	11.3	100.0
	Total	380	100.0	100.0	

It does not matter if I do well in school.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	127	33.4	33.4	33.4
	Kind of Agree	131	34.5	34.5	67.9
	Undecided	31	8.2	8.2	76.1
	Kind of Disagree	64	16.8	16.8	92.9
	Really Disagree	27	7.1	7.1	100.0
	Total	380	100.0	100.0	

Kids who get better grades than I do get more help from the teacher than I do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	140	36.8	36.8	36.8
	Kind of Agree	104	27.4	27.4	64.2
	Undecided	34	8.9	8.9	73.2
	Kind of Disagree	64	16.8	16.8	90.0
	Really Disagree	38	10.0	10.0	100.0
	Total	380	100.0	100.0	

I will quit school as soon as I can.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	139	36.6	36.6	36.6
	Kind of Agree	87	22.9	22.9	59.5
	Undecided	57	15.0	15.0	74.5
	Kind of Disagree	65	17.1	17.1	91.6
	Really Disagree	32	8.4	8.4	100.0
	Total	380	100.0	100.0	

Teachers like kids even if they do not make good grades.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	210	55.3	55.3	55.3
	Kind of Agree	80	21.1	21.1	76.3
	Undecided	14	3.7	3.7	80.0
	Kind of Disagree	40	10.5	10.5	90.5
	Really Disagree	36	9.5	9.5	100.0
	Total	380	100.0	100.0	

It is important to go to senior secondary school.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	141	37.1	37.1	37.1
	Kind of Agree	101	26.6	26.6	63.7
	Undecided	39	10.3	10.3	73.9
	Kind of Disagree	66	17.4	17.4	91.3
	Really Disagree	33	8.7	8.7	100.0
	Total	380	100.0	100.0	

I work hard in school

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	144	37.9	37.9	37.9
	Kind of Agree	90	23.7	23.7	61.6
	Undecided	22	5.8	5.8	67.4
	Kind of Disagree	68	17.9	17.9	85.3
	Really Disagree	56	14.7	14.7	100.0
	Total	380	100.0	100.0	

Most of my classmates work harder on their homework than I do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	67	17.6	17.6	17.6
	Kind of Agree	94	24.7	24.7	42.4
	Undecided	47	12.4	12.4	54.7
	Kind of Disagree	111	29.2	29.2	83.9
	Really Disagree	61	16.1	16.1	100.0
	Total	380	100.0	100.0	

I always get good grades when I try hard

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	76	20.0	20.0	20.0
	Kind of Agree	109	28.7	28.7	48.7
	Undecided	40	10.5	10.5	59.2
	Kind of Disagree	107	28.2	28.2	87.4
	Really Disagree	48	12.6	12.6	100.0
	Total	380	100.0	100.0	

I usually do not get good grades in mathematics because it is too hard.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Really Agree	75	19.7	19.7	19.7
	Kind of Agree	82	21.6	21.6	41.3
	Undecided	34	8.9	8.9	50.3
	Kind of Disagree	128	33.7	33.7	83.9
	Really Disagree	61	16.1	16.1	100.0
	Total	380	100.0	100.0	

When I study for a test, I try to put together the information from class and from the book.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	135	35.5	35.5	35.5
	Agree	125	32.9	32.9	68.4
	Neutral	36	9.5	9.5	77.9
	Agree	57	15.0	15.0	92.9
	Strongly Agree	27	7.1	7.1	100.0
	Total	380	100.0	100.0	

When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	122	32.1	32.1	32.1
	Agree	127	33.4	33.4	65.5
	Neutral	33	8.7	8.7	74.2
	Agree	67	17.6	17.6	91.8
	Strongly Agree	31	8.2	8.2	100.0
	Total	380	100.0	100.0	

It is hard for me to decide what the main ideas are in what I read.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	102	26.8	26.8	26.8
	Agree	137	36.1	36.1	62.9
	Neutral	25	6.6	6.6	69.5
	Agree	76	20.0	20.0	89.5
	Strongly Agree	40	10.5	10.5	100.0
	Total	380	100.0	100.0	

When I study I put important ideas into my own words.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	25	6.6	6.6	6.6
	Agree	45	11.8	11.8	18.4
	Neutral	29	7.6	7.6	26.1
	Agree	147	38.7	38.7	64.7
	Strongly Agree	134	35.3	35.3	100.0
	Total	380	100.0	100.0	

I always try to understand what the teacher is saying even if it doesn't make sense.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	25	6.6	6.6	6.6
	Agree	30	7.9	7.9	14.5
	Neutral	36	9.5	9.5	23.9
	Agree	143	37.6	37.6	61.6
	Strongly Agree	146	38.4	38.4	100.0
	Total	380	100.0	100.0	

When I study for a test I try to remember as many facts as I can.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	86	22.6	22.6	22.6
	Agree	138	36.3	36.3	58.9
	Neutral	24	6.3	6.3	65.3
	Agree	81	21.3	21.3	86.6
	Strongly Agree	51	13.4	13.4	100.0
	Total	380	100.0	100.0	

When studying, I copy my notes over to help me remember material.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	99	26.1	26.1	26.1
	Agree	127	33.4	33.4	59.5
	Neutral	30	7.9	7.9	67.4
	Agree	73	19.2	19.2	86.6
	Strongly Agree	51	13.4	13.4	100.0
	Total	380	100.0	100.0	

When I study for a test I practice saying the important facts over and over to myself.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	3.7	3.7	3.7
	Agree	30	7.9	7.9	11.6
	Neutral	20	5.3	5.3	16.8
	Agree	152	40.0	40.0	56.8
	Strongly Agree	164	43.2	43.2	100.0
	Total	380	100.0	100.0	

I use what I have learned from old homework assignments and the textbook to do new assignments.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	77	20.3	20.3	20.3
	Agree	95	25.0	25.0	45.3
	Neutral	47	12.4	12.4	57.6
	Agree	97	25.5	25.5	83.2
	Strongly Agree	64	16.8	16.8	100.0
	Total	380	100.0	100.0	

When I am studying a topic, I try to make everything fit together.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	1.6	1.6	1.6
	Agree	35	9.2	9.2	10.8
	Neutral	48	12.6	12.6	23.4
	Agree	166	43.7	43.7	67.1
	Strongly Agree	125	32.9	32.9	100.0
	Total	380	100.0	100.0	

When I read material for this class, I say the words over and over to myself to help me remember.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	1.3	1.3	1.3
	Agree	26	6.8	6.8	8.2
	Neutral	15	3.9	3.9	12.1
	Agree	165	43.4	43.4	55.5
	Strongly Agree	169	44.5	44.5	100.0
	Total	380	100.0	100.0	

I outline the chapters in my book to help me study.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.1	1.1	1.1
	Agree	21	5.5	5.5	6.6
	Neutral	17	4.5	4.5	11.1
	Agree	154	40.5	40.5	51.6
	Strongly Agree	184	48.4	48.4	100.0
	Total	380	100.0	100.0	

When reading I try to connect the things I am reading about with what I already know.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	2.6	2.6	2.6
	Agree	19	5.0	5.0	7.6
	Neutral	25	6.6	6.6	14.2
	Agree	168	44.2	44.2	58.4
	Strongly Agree	158	41.6	41.6	100.0
	Total	380	100.0	100.0	

I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	16	4.2	4.2	4.2
	Agree	44	11.6	11.6	15.8
	Neutral	29	7.6	7.6	23.4
	Agree	136	35.8	35.8	59.2
	Strongly Agree	155	40.8	40.8	100.0
	Total	380	100.0	100.0	

I work hard to do well in this class even if I don't like what we are doing.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	83	21.8	21.8	21.8
	Agree	111	29.2	29.2	51.1
	Neutral	39	10.3	10.3	61.3
	Agree	92	24.2	24.2	85.5
	Strongly Agree	55	14.5	14.5	100.0
	Total	380	100.0	100.0	

When work is difficult, I either give up or only study the easy parts.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	3.4	3.4	3.4
	Agree	30	7.9	7.9	11.3
	Neutral	17	4.5	4.5	15.8
	Agree	193	50.8	50.8	66.6
	Strongly Agree	127	33.4	33.4	100.0
	Total	380	100.0	100.0	

Even when course materials are dull and uninteresting, I manage to keep working until I finish.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	1.3	1.3	1.3
	Agree	18	4.7	4.7	6.1
	Neutral	17	4.5	4.5	10.5
	Agree	170	44.7	44.7	55.3
	Strongly Agree	170	44.7	44.7	100.0
	Total	380	100.0	100.0	

When studying, I try to combine different pieces of information from course material in new ways.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	23	6.1	6.1	6.1
	Agree	36	9.5	9.5	15.5
	Neutral	52	13.7	13.7	29.2
	Agree	155	40.8	40.8	70.0
	Strongly Agree	114	30.0	30.0	100.0
	Total	380	100.0	100.0	

I draw pictures or diagrams to help me solve some problems.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	157	41.3	41.3	41.3
	Agree	115	30.3	30.3	71.6
	Neutral	17	4.5	4.5	76.1
	Agree	55	14.5	14.5	90.5
	Strongly Agree	36	9.5	9.5	100.0
	Total	380	100.0	100.0	

I work several examples of the same type of problem when studying mathematics so I can understand the problems better.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	37	9.7	9.7	9.7
	Agree	59	15.5	15.5	25.3
	Neutral	41	10.8	10.8	36.1
	Agree	100	26.3	26.3	62.4
	Strongly Agree	143	37.6	37.6	100.0
	Total	380	100.0	100.0	

I work practice problems to check my understanding of new concepts or rules.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	163	42.9	42.9	42.9
	Agree	99	26.1	26.1	68.9
	Neutral	24	6.3	6.3	75.3
	Agree	52	13.7	13.7	88.9
	Strongly Agree	42	11.1	11.1	100.0
	Total	380	100.0	100.0	

I examine example problems that have already been worked to help me figure out how to do similar problems on my own.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	119	31.3	31.3	31.3
	Agree	135	35.5	35.5	66.8
	Neutral	26	6.8	6.8	73.7
	Agree	67	17.6	17.6	91.3
	Strongly Agree	33	8.7	8.7	100.0
	Total	380	100.0	100.0	

I classify problems into categories before I begin to work them.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	162	42.6	42.6	42.6
	Agree	107	28.2	28.2	70.8
	Neutral	31	8.2	8.2	78.9
	Agree	49	12.9	12.9	91.8
	Strongly Agree	31	8.2	8.2	100.0
	Total	380	100.0	100.0	

When I work a problem, I analyze it to see if there is more than one way to get the right answer.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	145	38.2	38.2	38.2
	Agree	98	25.8	25.8	63.9
	Neutral	46	12.1	12.1	76.1
	Agree	60	15.8	15.8	91.8
	Strongly Agree	31	8.2	8.2	100.0
	Total	380	100.0	100.0	

I try to memorize the steps for solving problems presented in the text or in class.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	206	54.2	54.2	54.2
	Agree	98	25.8	25.8	80.0
	Neutral	17	4.5	4.5	84.5
	Agree	41	10.8	10.8	95.3
	Strongly Agree	18	4.7	4.7	100.0
	Total	380	100.0	100.0	

When I study for tests I review my class notes and look at solved problems.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	149	39.2	39.2	39.2
	Agree	108	28.4	28.4	67.6
	Neutral	28	7.4	7.4	75.0
	Agree	62	16.3	16.3	91.3
	Strongly Agree	33	8.7	8.7	100.0
	Total	380	100.0	100.0	

When I study for tests I use solved problems in my notes or in the book to help me memorize the steps involved.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	147	38.7	38.7	38.7
	Agree	97	25.5	25.5	64.2
	Neutral	28	7.4	7.4	71.6
	Agree	60	15.8	15.8	87.4
	Strongly Agree	48	12.6	12.6	100.0
	Total	380	100.0	100.0	

I find reviewing previously solved problems to be a good way to study for a test.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	75	19.7	19.7	19.7
	Agree	104	27.4	27.4	47.1
	Neutral	46	12.1	12.1	59.2
	Agree	102	26.8	26.8	86.1
	Strongly Agree	53	13.9	13.9	100.0
	Total	380	100.0	100.0	

If I have trouble understanding a problem, I go over it again until I understand it.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	91	23.9	23.9	23.9
	Agree	121	31.8	31.8	55.8
	Neutral	33	8.7	8.7	64.5
	Agree	90	23.7	23.7	88.2
	Strongly Agree	45	11.8	11.8	100.0
	Total	380	100.0	100.0	

I try to complete homework assignments as fast as possible without checking my accuracy. (R)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	102	26.8	26.8	26.8
	Agree	89	23.4	23.4	50.3
	Neutral	36	9.5	9.5	59.7
	Agree	109	28.7	28.7	88.4
	Strongly Agree	44	11.6	11.6	100.0
	Total	380	100.0	100.0	

If I have trouble solving a problem, I'm more likely to guess at the answer than to look at examples in the book to try to figure things out. (R)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	133	35.0	35.0	35.0
	Agree	124	32.6	32.6	67.6
	Neutral	30	7.9	7.9	75.5
	Agree	62	16.3	16.3	91.8
	Strongly Agree	31	8.2	8.2	100.0
	Total	380	100.0	100.0	

If I have trouble solving a homework problem in the book, I copy down the answer in the back of the book if it is available. (R)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	122	32.1	32.1	32.1
	Agree	129	33.9	33.9	66.1
	Neutral	30	7.9	7.9	73.9
	Agree	64	16.8	16.8	90.8
	Strongly Agree	35	9.2	9.2	100.0
	Total	380	100.0	100.0	

If I have trouble solving a problem, I'll try to get someone else to solve it for me. (R)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	90	23.7	23.7	23.7
	Agree	104	27.4	27.4	51.1
	Neutral	24	6.3	6.3	57.4
	Agree	90	23.7	23.7	81.1
	Strongly Agree	72	18.9	18.9	100.0
	Total	380	100.0	100.0	

When I read something in the book that doesn't make sense, I skip it and hope that the teacher explains it in class. (R)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	22	5.8	5.8	5.8
	Agree	37	9.7	9.7	15.5
	Neutral	20	5.3	5.3	20.8
	Agree	129	33.9	33.9	54.7
	Strongly Agree	172	45.3	45.3	100.0
	Total	380	100.0	100.0	

When I run into a difficult homework problem, I keep working at it until I think I've solved it.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	3.4	3.4	3.4
	Agree	34	8.9	8.9	12.4
	Neutral	29	7.6	7.6	20.0
	Agree	135	35.5	35.5	55.5
	Strongly Agree	169	44.5	44.5	100.0
	Total	380	100.0	100.0	

When I run into a difficult homework problem, I usually give up and go on to the next problem. (R)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	71	18.7	18.7	18.7
	Agree	103	27.1	27.1	45.8
	Neutral	23	6.1	6.1	51.8
	Agree	94	24.7	24.7	76.6
	Strongly Agree	89	23.4	23.4	100.0
	Total	380	100.0	100.0	

```
RELIABILITY
  /VARIABLES=SE1 SE2 SE3 SE4 SE5 SE6 SE7 SE8 SE9 SE10 SE11 SE12 SE13 SE14 SE15 SE16 SE17
SE18 SE19
    SE20 SE21 SE22 SE23 SE24 SE25 SE26 SE27 SE28 SE29 SE30
  /SCALE('Academic Self-efficacy Scale') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
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APPENDIX VIII

Reliability

Scale: Academic Self-efficacy Scale

Case Processing Summary

		N	*%*
Cases	Valid	50	100.0
	Excluded[a]	0	.0
	Total	50	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	*N of Items*
.811	30

Item-Total Statistics

	Scale Mean if Item Deleted	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*
I am a good science student.	81.8000	188.980	.544	.796
Sometimes I think an assignment is easy when other kids think it is hard.	82.0200	195.449	.349	.804
I am a good social studies student	81.4800	185.969	.571	.794
I am one of the best students in my class	82.2400	194.104	.458	.801
My teacher thinks I am smart	81.9800	193.122	.442	.801
I am a good mathematics student.	81.5600	191.802	.425	.801
My classmates usually get better grades than I do.	81.5400	184.049	.550	.794
I usually understand my homework assignments.	81.9800	192.102	.500	.799
I could get the best grades in class if I tried hard enough.	81.6800	186.712	.612	.794
I am good in reading.	81.6400	190.113	.462	.799
It is not hard for me to get good grades in school.	81.9600	185.958	.637	.793

I am smart.	81.8200	188.926	.464	.799
When the teacher asks a question, I usually know the answer even if the other kids don't.	82.0200	195.449	.349	.804
Most of my classmates like to do mathematics because it is easy.	80.0000	211.592	-.119	.821
I would get better grades if my teacher liked me better.	79.5200	210.010	-.076	.815
I will graduate from senior secondary school.	79.5400	212.866	-.202	.819
I attend a good school.	79.8400	211.362	-.122	.818
Adults who have good jobs probably were good students when they were kids.	79.3600	209.174	-.034	.814
When I am old enough I will go to college.	79.4600	210.784	-.111	.816
No one cares if i do well in school.	80.1400	202.939	.114	.814
What I learn in school is not important.	81.1200	205.618	.038	.817
It does not matter if I do well in school.	81.3800	194.934	.310	.806
Kids who get better grades than I do get more help from the teacher than I do.	81.6200	197.873	.235	.809
I will quit school as soon as I can.	81.4800	188.255	.513	.797
Teachers like kids even if they do not make good grades.	81.6600	208.392	-.040	.823
It is important to go to senior secondary school.	81.8800	191.455	.456	.800
I work hard in school	81.9400	198.547	.249	.808
Most of my classmates work harder on their homework than I do.	81.1200	189.659	.493	.798
I always get good grades when I try hard	81.5600	190.700	.450	.800
I usually do not get good grades in mathematics because it is too hard.	81.2400	189.125	.487	.798

Scale Statistics

Mean	*Variance*	*Std. Deviation*	*N of Items*
84.0200	208.959	14.45541	30

```
RELIABILITY
  /VARIABLES=CSQ1 CSQ2 CSQ3 CSQ4 CSQ5 CSQ6 CSQ7 CSQ8 CSQ9 CSQ10 CSQ11 CSQ12 CSQ13
EFF1 EFF2 EFF3
    EFF4 DCP1 DCP2 DCP3 DCP4 DCP5 DCP6 DCP7 SP1 SP2 SP3 SP4 PS1 PS2 PS3 PS4 PS5 PS6 PS7
PS8
  /SCALE('Cognitive Engagement Scale') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

APPENDIX IX

Reliability

Scale: Cognitive Engagement Scale

Case Processing Summary

		N	*%*
Cases	Valid	50	100.0
	Excluded[a]	0	.0
	Total	50	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	*N of Items*
.777	36

Item-Total Statistics

	Scale Mean if Item Deleted	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*
When I study for a test, I try to put together the information from class and from the book.	110.5000	192.908	.459	.763
When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.	110.6800	193.079	.464	.763
It is hard for me to decide what the main ideas are in what I read.	110.7800	193.236	.466	.763
When I study I put important ideas into my own words.	109.0800	204.279	.183	.776
I always try to understand what the teacher is saying even if it doesn't make sense.	108.9000	211.929	-.061	.783
When I study for a test I try to remember as many facts as I can.	110.3200	193.977	.400	.766
When studying, I copy my notes over to help me remember material.	110.6400	196.113	.348	.768
When I study for a test I practice saying the important facts over and over to myself.	108.7600	211.941	-.062	.782
I use what I have learned from old homework assignments and the textbook to do new assignments.	110.1000	199.929	.251	.773
When I am studying a topic, I try to make everything fit together.	108.9600	202.937	.318	.771
When I read material for this class, I say the words over and over to myself to help me remember.	108.6800	207.569	.121	.777

I outline the chapters in my book to help me study.	108.5800	203.432	.358	.771
When reading I try to connect the things I am reading about with what I already know.	108.9200	211.259	-.033	.781
I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.	109.0600	211.935	-.063	.785
I work hard to do well in this class even if I don't like what we are doing.	110.2600	199.135	.250	.773
When work is difficult, I either give up or only study the easy parts.	108.9400	207.486	.140	.777
Even when course materials are dull and uninteresting, I manage to keep working until I finish.	108.5800	213.269	-.122	.783
When studying, I try to combine different pieces of information from course material in new ways.	109.0000	218.939	-.316	.791
I draw pictures or diagrams to help me solve some problems.	111.0400	203.509	.155	.778
I work several examples of the same type of problem when studying mathematics so I can understand the problems better.	109.1600	209.974	-.015	.785
I work practice problems to check my understanding of new concepts or rules.	110.1400	209.062	.006	.785
I examine example problems that have already been worked to help me figure out how to do similar problems on my own.	110.4000	196.367	.328	.769

I classify problems into categories before I begin to work them.	110.6400	189.051	.530	.759
When I work a problem, I analyze it to see if there is more than one way to get the right answer.	110.5000	190.214	.516	.760
I try to memorize the steps for solving problems presented in the text or in class.	110.6800	203.528	.122	.780
When I study for tests I review my class notes and look at solved problems.	110.9000	188.541	.606	.757
When I study for tests I use solved problems in my notes or in the book to help me memorize the steps involved.	110.9600	197.835	.331	.769
I find reviewing previously solved problems to be a good way to study for a test.	110.1400	190.368	.533	.760
If I have trouble understanding a problem, I go over it again until I understand it.	110.5800	195.759	.366	.768
I try to complete homework assignments as fast as possible without checking my accuracy. (R)	110.2600	193.380	.427	.765
If I have trouble solving a problem, I'm more likely to guess at the answer than to look at examples in the book to try to figure things out. (R)	110.5000	192.908	.459	.763
If I have trouble solving a homework problem in the book, I copy down the answer in the back of the book if it is available. (R)	110.6800	193.079	.464	.763

If I have trouble solving a problem, I'll try to get someone else to solve it for me. (R)	110.7800	193.236	.466	.763
When I read something in the book that doesn't make sense, I skip it and hope that the teacher explains it in class. (R)	109.0800	204.279	.183	.776
When I run into a difficult homework problem, I keep working at it until I think I've solved it.	108.9000	211.929	-.061	.783
When I run into a difficult homework problem, I usually give up and go on to the next problem. (R)	110.3200	193.977	.400	.766

Scale Statistics

Mean	*Variance*	*Std. Deviation*	*N of Items*
113.0400	211.141	14.53070	36